EFFECT OF MIRACLE LEAVES EXTRACT ON HEMOGLOBIN LEVELAMONGADOLESCENT GIRLS WITH ANEMIA IN ARUNACHALAM HIGHER SECONDARY SCHOOL AT KANYAKUMARI DISTRICT

A DISSERTATION SUBMITTED TO THE TAMILNADU DR.M.G.R. MEDICAL UNIVERSITY CHENNAI, IN PARTIAL FULFILMENT FOR THE DEGREE OF MASTER OF SCIENCE IN NURSING

OCTOBER - 2017

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Internal Examiner **External Examiner**

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OCTOBER 2017

BONAFIDE CERTIFICATE

This is to certify that the dissertation entitled "**A Study to Assess the Effect of Miracle leaves Extract on Hemoglobin level among Adolescent Girls with Anemia in Arunachalam Higher Secondary School at Kanyakumari district"** is a bonafide research work done by **Mrs.Jenila, II year M.Sc (N).,** Sree Mookambika College of Nursing, Kulasekharam under the guidance of **Mrs. Suja Renjini, M.Sc., (N), Associate Professor of Child Health Nursing,** in partial fulfillment of the requirements for the Degree of Master of Science in Nursing under Tamil Nadu Dr. M.G.R Medical University.

Principal

Place : Kulasekharam

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Date : 07.08.2017

Kulasekharam.

CERTIFICATE

This is to certify that the dissertation entitled "**A Study to Assess the Effect of Miracle leaves Extract on Hemoglobin level Among Adolescent Girls with Anemia in Arunachalam Higher Secondary School at Kanyakumari district"** is the outcome of the original research work under taken by me under the guidance of **Mrs. Suja Renjini, M.Sc., (N), Associate Professor of Child Helath Nursing,** Sree Mookambika College of Nursing, Kulasekharam. I also declare that the material of this has not formed any way the basis for the awarded of any degree or diploma in this university or any universities.

Place : Kulasekharam N.Jenila

Date : 07.08.2017 II year M.Sc., (N)

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INVESTIGATOR

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ABSTRACT

INTRODUCRION

Adolescence period is also a sensitive period particularly for girls. Most of them are having poor access to proper health care, nutrition and education. Girls typically start puberty around age 10 – 12 yrs and achieve their full adult height by the age of 15. Adolescent girls are at a high risk for anemia and malnutrition. Inadequate nutrition during adolescence can have serious consequence throughout the reproductive years of life. Anemia is a condition in which reduced hemoglobin levels leads to diminished oxygen carrying capacity that does not optimally meet the metabolic demands of the body. The reasons for the high incidence of anemia among the adolescent girls are, Increased iron requirements because of growth, Menstrual loss, Discrepancy between high iron need for hemoglobin formation and low intake of iron containing foods. The Miracle leaves extract contributes to improve hemoglobin level in the blood. Miracle leaves extract contains some of the benefits that is free radicals, fights inflammation, reduce some diabetes symptoms, protect the cardiovascular system supports brain health, protect the liver, enhances wound healing and improve hemoglobin level also. The cost is low when compared with other iron rich vegetables.

Objective:

The objective of the study was to assess the pre and post interventional level of Hemoglobin among adolescent girls in experimental and control group.

Methodology

The research design selected for the study was quantitative research design. Purposive sampling techniques were adopted for the study. The sample was selected on the basis of inclusion and exclusion criteria. The study sample was 60 adolescent girls. Pre test was conducted in both group by using the

anemia assessment check list, and Hemoglobin level was checked with the help of digital Hemoglobinometer. Miracle leaves extract was administer to experimental group at midmorning (9am) after breakfast for 20 days. After 25th day of Miracle leaves administration post test was done by using the digital Hemoglobinometer.The collected data is planned to be analyzed using descriptive and inferential statistics, such as percentage means, t-test and chi-square test. The study identified that the post test hemoglobin Mean score in the experimental group is 12 and SD is 0.89. In control group Mean score is 10.3 and SD is 0.77. The Mean difference is 1.7. The calculated' value 6.12 is higher than the table value 2.0. The calculated value of't' test suggested that was significant difference before and after the consumption of Miracle leaves extract among adolescent girls. This study finding reveals that there is an association between the demographic variables and the Hemoglobin level.

Conclusion:

The conclusion of the study shows that Miracle leaves extract was very effective alternative therapy in increasing Hemoglobin level.

SECTION B

DIGITAL HEMOGLOBINOMETER

DESCRIPTION

A Hemoglobinometer is an instrument used to determine the Hemoglobin content of the blood by spectrophotometric measurement. Portable Hemoglobinometers provide easy and convenient measurement, which is particularly useful in areas where clinical laboratories are available. It is also useful in emergencies due to its ease-of-use, accuracy and fast delivery of results.

The Level of Anemia is classified as,

Above 12gm/dl - Healthy

10-11.9gm/dl - Mild anemia

8-9.9gm/dl - Moderate anemia

Below 8gm/dl - Severe anemia

PART : A

DEMOGRAPHIC VARIABLES

Sl. No	Items		Remarks
	Accepted	Not Accepted	
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CHAPTER-1

INTRODUCTION

The Adolescent girls still remains a young planet that neither gets light or water , she remains the flower that could have blossomed but didn't.

(Sonia Arora)

The word adolescence is coined from Latin word "Adolescere" that implies *"to grow into maturity*". Adolescent is a transitional stage of physical and Psychological human development that generally occurs during that period from puberty to adulthood.

Adolescence begins with the onset of puberty. It is defined by the UNICEF as the sequence of events by which the individual is transformed into a young adult by a series of biological changes. According to WHO , adolescence is the period of life that extends from 10 years to19 years .It is divided in three phases early, middle, and late adolescence.

Adolescence period is also a sensitive period particularly for girls. Most of them are having poor access to proper health care, nutrition and education. Adolescence is a time of intense physical growth. Girls typically start puberty around age 10 – 12 yrs and achieve their full adult height by the age of 15.

Adolescent girls are at a high risk for anemia and malnutrition. Inadequate nutrition during adolescence can have serious consequence throughout the

reproductive years of life. In India, girls get married and pregnant even before the growth period is over, thus doubling the risk for anemia.

Under nutrition during childhood adolescence is associated with higher risk for preterm delivery and still birth or miscarriage, women with low body mass index and short statures are at increased risk for under nutrition perinatal and neonatal mortality.

Anemia is a condition in which reduced hemoglobin levels leads to diminished oxygen carrying capacity that does not optimally meet the metabolic demands of the body. The reasons for the high incidence of anemia among the adolescent girls are, Increased iron requirements because of growth, Menstrual loss, Discrepancy between high iron need for hemoglobin formation and low intake of iron containing foods, Erratic eating habits, dislike for foods which are rich in iron, like green leafy vegetables.

Anemia among women also contributes to infant health by intra-uterine growth retardation, low birth weight and ultimately perinatal mortality, and a high risk of irreversible brain damage in infants. Anemia is more likely to occur during Adolescence when there is rapid growth and menstrual loss of iron.

The signs and symptoms of Anemia is Easy fatigue and loss of energy, unusually rapid heartbeat, particularly with exercise shortness of breath and head ache particularly with exercise. Difficulty concentrated dizziness, pale skin, leg cramps, insomnia, spoon shaped nails, light – headedness.

Iron – deficiency anemia occurs because of a lack of the mineral iron in the body. Bone marrow in the under of the bone needs iron to make hemoglobin, the part

of the red blood cell that transports oxygen to the body's organs without adequate iron, the body cannot produce enough hemoglobin for red blood cells. The result is iron – deficiency anemia.

Iron deficiency anemia was prevented by adequate intake or iron rice green leafy vegetables such as drumstick leaves, amaranth us, spinach, coriander leaves, radish leaves, vegetables such as beet roof, drumstick, cereals like ragi, barely, rice (raw milled), legumes like Bengal gram dhal, black gram dhal, soya beans, nuts and oil seeds, and fruits such as chickoo, pomegranate and jaggary. (Swaminathan, 2008)

The plant miracle leaves is the most widely cultivated species of a monogenic family, the moringaceae that is native to the sub Himalayan part of India, Pakistan ,Bangladesh, and Afghanistan {pallada and chang (2003). It is now cultivated and has become naturalized in many locales in the tropics. Miracle leaves is reported to prevent malnutrition because of the high protein and micronutrient content of the leaves, [Anjorin et.al.2010]. The minerals contents in miracle leaves and their bioavailability have been subject tremendous studies. The leaves of this contain a profile of important trace elements and are a good source of protein, beta- carotene, amino acids and various phenolics.

The plant has been said to be a promising remedy for anemia especially iron deficiency anemia. The plant [fresh] has been used to compact malnutrition, especially among infants and nursing mother.

The Miracle leaves extract contributes to improve hemoglobin level in the blood. Miracle leaves extract contains some of the benefits that is free radicals, fights inflammation, reduce some diabetes symptoms, protect the cardiovascular system supports brain health, protect the liver, enhances wound healing and improve

hemoglobin level also. The cost is low when compared with other iron rich vegetables.

NEED FOR THE STUDY:

Anemia is one of the most common public health problems worldwide and especially in developing countries. Based on the world health organization (WHO) criteria, more than two billion people in the Eastern Mediterranean Region (EMRO) are estimated to be anemic. The most common type of nutritional anemia is iron deficiency anemia which is approximately responsible for 50% of all anemia. The major consequences of anemia are increased risk of maternal and child mortality followed by negative effects on physical and maternal development of children and decreased learning and work capacity and influencing on reproductive health in adolescents. Anemia has been a public health concern in children and pregnant women. There are many studies with regard to these high risk groups. Adolescents make up roughly 20% of world population and even higher proportion in developing countries. It seems that adolescent girls are also at increased risk of anemia due to period of rapid growth and developmental process of adolescence which cause higher requirement on both micro and macronutrients especially in girls who attend menarche. In addition, iron status and hemoglobin concentration in this group could be a predisposing factor for maternal anemia.

More than half of the children in 10 out of 15 status are still anemia shows National Family Health Survey (NFHS) for 2015-16 released by the union Health Ministry.

Globally 25% (600million) of older children (5-15years) are estimated to be anemic. The WHO currently defines anemia as having a hemoglobin concentration

below 12gm/dl in children 12-14 years. These thresholds are set the fifth percentile of the hemoglobin of a normal population. It has been estimated that about half of anemia is due to iron deficiency.

According to Corporate Social Responsibility in women health care with Federation of Obstetric and Gynecological societies of India (FOGSI) says that about 20% of maternal death occurs due to anemia. According to WHO (2009) Maternal Mortality rate is 250 occurs due to anemia. According to National Family Health Survey (NFHS) has reported that a large percentage of women and children are anemic. According to International Center for Research on Women (ICRW) 2009 says that anemia rate is adolescent girls 58% are having <12gm/dl and 1.3% are having <7gm/dl hemoglobin. In Tamilnadu 44.8% adolescent girls are there, in that 2.1% are having severe anemia, 6.3% are having moderate premenarcheal anemia are 40.7% post menarcheal anemia are 15.2%. According to the latest National Health Survey (NFHS) report 2015, every 55 out of 100 women in Tamilnadu are anemic. A whopping 55.4% percent of women between 15 and 49 years of age have been found to be anemic in Tamilnadu. It is a 3.4% percent increase in incidence of anemia over the last 10years.

Savita et.al (2013) studied that impact of education intervention on nutritional knowledge of iron deficiency anemia among 207 adolescent girls in Bangalore. The prevalence of anemia observed that 53.14% were found to be moderately anemic 42.51% were found to be mildly anemic and 2.89% were to be found severely anemic and only 1.44% had normal hemoglobin level.

Siddharam et.al (2011) conducted a study to estimate prevalence of anemia among adolescent girls. A cross sectional survey was conducted in selected

Anganwadi centers 314 adolescent girls (10-19 years) were included in the study. In the present study it was seen that among the 45.2% of anemic adolescent girls 40.1% had mild anemia, 54.92% had moderate anemia and4.92% severe anemia. It was seen that anemia affects overall status of adolescent girls.

Ajgonkar et.al (2010) conducted a study on prevalence of iron deficiency anemia (IDA) among adolescent girls (11-21years). In this study include using purposive sampling technique. Standardized questionnaire was used to determine the eating habits of the subjects. The study was carried out in the 100 adolescent girls. Anemia detection on was done by estimation of complete blood count using mythic-18, an automated blood cell counter. The prevalence of IDA was found to be 50% despite majority of the subjects (42%) being non-vegetarians. The highest frequency was found among the Hindu (24%) and Muslim 21% community.

Anemia in adolescent girls has for implications. The anemic adolescent girls grow into adult women with compromised growth, both physical and mental. These women have low pre-pregnancy weight, and are more likely to die during child birth and deliver low birth weight babies. So these present facts indicate that a study about how to improve hemoglobin level in adolescent girls who have anemia is highly needed. And the remedy should be low cost and easily available.

Statement of Problem:

"A Study to Assess the Effect of Miracle leaves Extract on Hemoglobin level among Adolescent Girls with Anemia in Arunachalam Higher Secondary School at Kanya Kumari District".

Objectives Of The Study

1. To assess the pre and post interventional level of Hemoglobin among adolescent girls in experimental and control group.
2. To determine the Effect of Miracle leaves extract on anemia among adolescent girls in experimental group.
3. To find out the association between Hemoglobin level among Adolescent girls with selected Demographic variables such as Age, Education, Religion, Food Habits, Age At Menarche, Duration Of Menstrual Cycle, Education Of Father, Education Of Mother, Occupation of Father, Occupation of Mother, Type of Family, Monthly Income of Parents and Source of Health Information.

Hypotheses;

- **H_1-** There is a significant improvement in Hemoglobin level among adolescent girls consuming miracle leaves extract.
- **H_2 -** There is a significant association between level of Hemoglobin and selected Demographic variables.

Operational Definition:

Effect:

In this study effect refers to the change in the Hemoglobin level after the administration of Miracle leaves extract for a period of 20 days to the adolescent girls.

Anemia:

Anemia refers to healthy Adolescents with symptoms of Pallor, Shortness Of Breath, Dizziness, Fast Heart Beat, Weakness, Feeling Tired, Head Ache, Leg

Cramps, Insomnia, Difficulty In Concentration, Loss Of Appetite, Presence Of Hair Loss, Anxious Without Specific Reason, Coldness in Hand and Feet and Sore tongue, associated with hemoglobin level between 8-11.9gm/dl.

Adolescent Girls:

In this study Adolescent girls refers to the girls between the age group of 13-15 years who attained Menarche.

Miracle Leaves Extract:

In this study Miracle leaves extract (drum stick leaves) refers to the matured Miracle leaves were shade-dried for 4 days after which they were milled into fine power with the aid of electric blender. Miracle leaves extract was prepared from mixing 10gm dried and powdered Miracle leaves with 10ml of boiled water for five minutes. The mixture was then filtered twice through 2µm pore sterile filter paper into an ounce glass. Miracle leaves extract 1ml was administered to each samples of experimental group at midmorning (9am) after breakfast.1ml of Miracle leaves extract contains 25mg of iron.

Variables:

Independent variable

- Miracle leaves extract.

Dependent variable

- Level of hemoglobin

Demographic variables

- The demographic variables such as Age, Education, Religion, Food habits, Age at Menarche, Duration of Menstrual Period, Education of Father, Education of Mother, Occupation of Father, Occupation of Mother, Type of Family, Monthly income of Parents, Source of health information.

Assumption:

The proposed study assumed that

1. Most of Adolescents are Anemic;
2. Miracle leaves Extract will improve Hemoglobin level;

Delimitation:

Study is delimited to the adolescent girls between 13-15years the Arunachalam Higher Secondary School at Thiruvattar.

Ethical consideration:

The study was conducted only after the approval of the college research ethical committee. Written permission was obtained from the principal of the selected school. Oral consent was obtained from each adolescent girls as well as parents also before administration of Miracle leaves extract.

Conceptual frame work:

Conceptualization refers to the process of developing and refining abstract. The conceptual frame work is a global idea about concept in relation to specific discipline.

One of the important purpose of theoretical framework is to communicate clearly and the relationship of various concepts.

The conceptual framework for this study was derived from-modified J.W. Kenny's open system model (1990). Open system model serves as a model for reviewing people as interacting with the environment.

Open system model is a set of related definition, assumption and preposition which deals with reality but pays particular attention to the interaction with one another in order to achieve a goal.

Input:

Input is the intervention done by the researcher. In this study input refers to administration of 1ml Miracle leaves extract for adolescent girls with anemia. In experimental group administered miracle leaves extract. In control group not administered miracle leaves extract.

Through put:

Through put is the activity phase. Miracle leaves extract can change the Hemoglobin level in an experimental group.

Out put

The expected outcome is improvement in the level of hemoglobin after providing the Miracle leaves extract. The hemoglobin level is measured by Hemoglobinometer. In the present study, the experimental group shows that improvement in hemoglobin level and the control group has no improvement in Hemoglobin level.

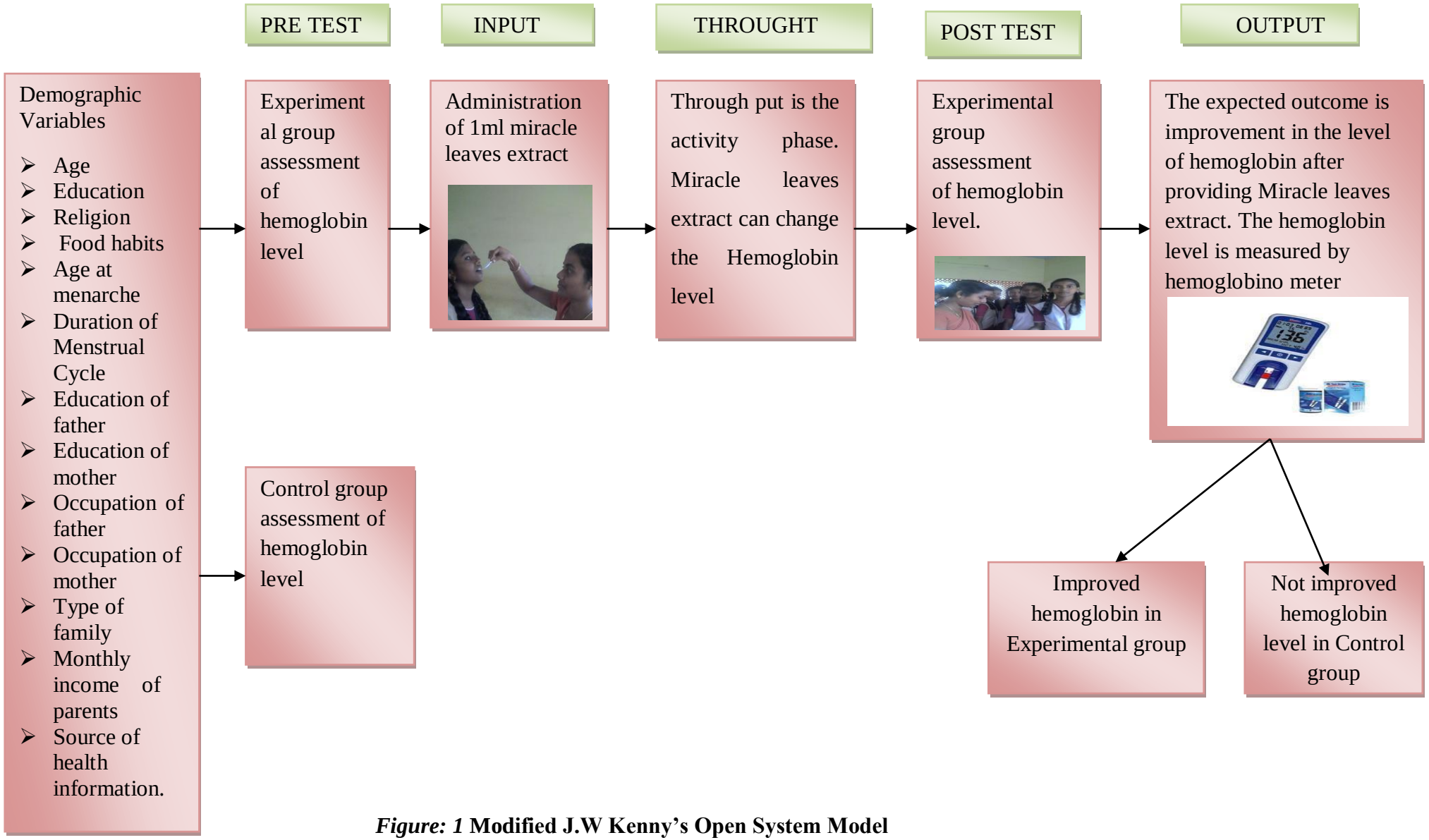


Figure: 1 **Modified J.W Kenny's Open System Model**

CHAPTER II

REVIEW OF LITERATURE

Review of literature is a key in process. It is an account of what is already known above a particular phenomenon .the main purpose of the literature review is to convey to the reader's about the work already done and knowledge and ideas that have been already established on a particular topic of research. It refers to an extensive, exhaustive and systematic of publication relevant to the research project.

The literature is reviewed and organized under the heading:

1. Studies related to prevalence of anemia among adolescent girls
2. Studies related to management of anemia
3. Studies related to effectiveness of miracle leaves extract

1. Studies related to prevalence of anemia among adolescent girls:

Chauhan a. S et.al (2015) conducted a cross sectional study on anemia among adolescent girls in Ahmadabad. The sample selected from adolescent friendly health service (AFHS) clinics in Ahmadabad city. Sample size was 467 adolescent girls. The age group is 10-19years. Semi-structured pre-test questionnaire was used for this study. Hemoglobin testing was done using Sahli's hemoglobinometer. Data were analyzed using statistical software. Frequencies were obtained using descriptive statistics. Associations were inferred by chi-square test. P value <0.05 was considered significant. Out of 325 adolescent girls, majority (42%) belonged to the age group 13-15 years (mid adolescence) while 23.4% adolescent girls were in early adolescence (10-12 years) and 34.6% adolescent girls were in late adolescence (16-19 years). Age range of studied adolescent girls was from 10-19 years with mean age 14.5+2.4 years.

The study finding revealed that prevalence of anemia among adolescent girls was 85.9%. Highest prevalence was observed during mid- adolescent phase.

Preveen k. Naik et. al (2014) conducted a study on prevalence and severity of anemia stratified by age and gender in rural India. The retrospective observational study was used for patients attending the out-patient clinics of rural hospital in India from June 2011 to august 2014. The study included 73,795 determinations of hemoglobin from 69,440 patients, of which 34,399 (49.5%) patient were females. Data were collected by epidemiological and laboratory base from the hospital. Statistical analysis was performed using stats statistical software. The study finding revealed that the highest prevalence of mild and moderate anemia seen in children <10years.after puberty, the prevalence of anemia was constantly over 50% in females. They identified iron deficiency is the major cause of anemia in females. So the researcher concluded that the public programs can be reduced the burden of anemia.

Ramesh verma et. al (2014) conducted a study on prevalence of anemia among school going adolescent girls. Semi-structured pre-test questionnaire was used for this study. The study included 320 adolescent girls (13-15years) from selected government secondary schools of district Rohtak (haryana). Random sampling technique used. Hemoglobin estimation was done by cynmethaemoglobin method. Data was analyzed by using descriptive and inferential statistical technique. The study finding revealed that (73%) among study subject, (54%) of girls had mild anemic, (18%) of girls had moderate anemic and (1%) girls were severely anemic. The study found that majority of girls belonged to 14-15years (51%) age group, 16-17years (45%) and 3 cases found in >17years.

Sanjay Kumar Gupta et. Al (2012) conducted a cross sectional study on prevalence of anemia among rural population living around the rural health center in Madhya Pradesh. Data were collected by using convenient sampling method. Hemoglobin estimation done by sahli's method. Data was analyzed by using descriptive and inferential statistical technique. The study finding revealed that that 42% of anemic cases between the age group of 11-25years. Among them, 82% of females and 18% of males have anemia, in that females 32.52% were having mild anemia, 42% were having moderate anemia, and 3% were having severe anemia. The study identified that the prevalence of anemia was high in females compared to males.

Suchitra Rati et. al (2012) conducted a study on prevalence of anemia among adolescent girls studying in selected school in Karnataka. Descriptive exploratory research design was used. Sample size is 300 adolescent girls of Nidoni who met the inclusion criteria. Data were collected by using non probability sampling method. Hemoglobin estimation done by with the help of laboratory center. Data was analyzed by mean, standard deviation and chi-square test. The study finding revealed that the prevalence of anemia among adolescent girls was 80%, in that 48.75% were mild anemic, 42.5% were moderate anemic, and 8.75% had severe anemic. The result of study majority of the adolescents are having anemia. So reinforce that nutritional education should be given both parents and to children.

Siddharam S.M et. al (2011) conducted a cross sectional study on anemia among adolescent girls in rural area of Hassan district. Descriptive study design was used. Sample size was 314 convenient sampling technique was used. Data were analyzed by using the proportions and chi-square test. The study finding revealed that prevalence of anemia was found to be 45.2% in that 40.1% had mild anemia, 52.92% had moderate anemia and 4.92% had severe anemia. A high prevalence of anemia

among adolescent girls was found, which was higher in low economic strata. The result of the study anemic affects overall nutritional status of adolescent girls. Prevalence of anemia was very high 90.1% among adolescent girls. Majority of the girls were having mild and moderate anemia 88.6%.

Agarval et. al (2010) conducted a multistage observational study on prevalence of anemia among adolescent girls in utter Pradesh. Cross sectional study design was used. In this study sample size was 576. Random sampling technique was used. Data were collected using by hemoglobinometer. Data was analyzed by mean, standard deviation and chi-square test. The study findings revealed prevalence of anemia over all 83.3% of adolescent girls are anemic. Almost all of the rural (100%) and slum (99.3%) girls were found anemic.

Saratha. A et. al (2010) conducted a cross-sectional study on prevalence of anemia among young adult female students in a medical teaching institution in Pondicherry. Among 300 medical and nursing students. 228 (76%) were anemic. A pre-design was used for this study. Data were collected by using pre-tested self administered questionnaire interview method. Data were analyzed by using spss package and the chi-square test was used for testing statistical significance. The level of significance was taken at p-value <0.05. In this study revealed that 170 (56.67%) had mild and 58 (19.33%) had moderate anemia.157 (89.71%) students who did not consume green leafy vegetable regularly were anemic. 97 (32.33%) students gave history of passing worms in stool. Association between anemia and increase age, increase academic year, consumption of green leafy vegetables was significant. Thus they concluded that the prevalence of mild anemia among young adult female medical and nursing students were high, concerted effort is needed for dietary and iron supplementation for correction of anemia.

P. R. Malar et. al (2008) conducted a cross- sectional study on prevalence of anemia among adolescent girls in rural areas. Sample selected from primary health center, age group 10-19years. Sample size 840 random sample method is used. Data were collected by using an automated cell counter. Data were analyzed by using statistical chi-square test. The study finding revealed that prevalence of anemia was 345 (41.1%), severe anemia being 2 (0.2%), that of moderate anemia being 53 (6.3%), and 290 (34.6%) were mildly anemic. This study concluded that the prevalence of anemia was high in late adolescents (15-19years) as compared to that in the early adolescents (10-14years).

Vinod Kumar Menta (2003) conducted a cross-sectional study on prevalence of anemia among adolescent girls aged 12 to 16years in urban and rural areas of Shimla district Himachal Pradesh. Sample size was 691 schoolgirls (12-16years) by using random sampling method. A semi-structured questionnaire was used to obtain data on socio-demographic variables, knowledge, treatment and prevention of anemia among study subjects. Hemoglobin was estimated using cyanmethaemoglobin technique. WHO classification of anemia was used to estimate and compare prevalence after applying altitude correction factor for hemoglobin technique. The study findings revealed that prevalence of anemia among rural and urban school girls was 66.6% and 68.2% respectively. Poor academic performance was associated with anemia among rural school girls (x^2=10.69; p=0.001).

2. Studies related to management of anemia:

Suryani A.S (2016) conducted a study to assess the effectiveness of drumstick leaves extract on hemoglobin level. Randomized double blind, pretest-posttest control group designs was used for this study. A total 60 adolescent girls were selected for the study, in that 30 girls were in experimental group and 30 girls were in control group. Data were collected by using random sampling technique. Before and after intervention hemoglobin level was measured by cynmenthemoglobin method. Data were analyzed by descriptive inferential statistical technique. Samples in the experimental group shows a highly significant improvement in hemoglobin level after administration of drumstick leaves extract ($p<0.001$) in comparison with the control group.

Chandra et. al (2015) conducted a cross sectional study on effect of drumstick leaves extract treating iron deficiency anemia in rural area Pichavaram. Pre experimental design was used. Sample size was 60 convenient sampling technique is used. Data were collected using a cynmethaemoglobin method. Data were analyzed by using descriptive and inferential statistics. The study revealed that in the experimental group pre-test was 9.7± 1.218 and post test was 11.03± 1.685. The difference in the pre-test and post-test mean value was statistically significant at $p<0.05$ level, $t=2.9759$. There was a significant improvement in the level of hemoglobin and proved that the intervention of drumstick leaves extract was effective in enhancing the level of the hemoglobin.

Dr. Gayathri Priya et. al (2013) conducted a study to assess the effectiveness of beetroot juice on hemoglobin among adolescent girls in Aringar Anna government higher secondary school, Chennai. True experimental design was used for this study.

A total of 60 adolescent girls were selected for the study, in that 30 girls were in experimental group and 30 girls were in the control group who fulfilled the inclusion criteria. Data were collected by using simple random sampling technique. The freshly prepared beetroot juice was administered to the samples for 20 days in midmorning. Pre and post assessment was done using the checklist for assessing the signs and symptoms of anemia and cyanmethemoglobin method for checking the hemoglobin level. The data analysis was done by using descriptive and inferential statistics. Samples in the experimental group shows a highly significant improvement in hemoglobin level following the administration of beetroot juice ($p<0.001$) in comparison with the control group. By this anemia can be prevented among the adolescent girls and in future the complication due anemia can be prevented.

Souzaqueiroz et. al (2013) conducted a quasi-experimental study to find the effectiveness of Amla juice in prevention of anemia among adolescent girls at selected hospitals in Kerala. 60 samples were selected by purposive sampling technique 30 in experimental group and 30 in control group. Pretest was done to both experimental and control group which revealed 63% had moderate anemia, 37% had severe anemia. After one month of intervention the post test shows that the level of anemia in experimental group (96.7%) had mild anemia, one (3.3%) had moderate anemia and no women had severe anemia, and in control group 25(83.3%) had mild anemia, 5(16.7%) had moderate anemia and nobody had severe anemia. The study was concluded that amla juice was very effective improve the hemoglobin level.

K**rishna Mohan et.al (2010**) conducted a comparative study to assess the effectiveness of Amla juice on hemoglobin level among patients with iron deficiency anemia (IDA). True experimental research design was used for this study. All patients

admitted to hospital were provided medication and Amla juice for 4 weeks. A total of 19 anemia patients (7gms/dl) were selected by purposive sampling technique. Eleven anemic patients receiving Amla juice, and 8 samples were receiving medication. The data analysis was done by using descriptive and inferential statistics. Results shows that after 4 weeks the 11 patients received Amla juice were increased hemoglobin levels (between the ranges of (12-13g/dl) comparing to the 8 members received medication (9-10g/dl). So they concluded that Amla juice was very effective on improving hemoglobin level.

3. Studies related to miracle leaves:

Rajathi. A (2014) conducted a study on effectiveness of drumstick leaves extract to reducing blood glucose among hyperglycemic clients in Thandalam. The pre-experimental design was used in that study. The sample size was 30. Probability convenience sampling technique was used for this study. Data were collected by using Glucometer. Data were analyzed by statistically package of social science (spss) version 19. The study finding revealed that the effectiveness of drumstick leaves on glucose level with the value $p<0.05$.

Aishiwini bidwe et.al (2013) conducted a study effect of drumstick leaves powder chutney on blood pressure among hypertensive patients. True experimental design was used. Sample size was 40 purposive sampling technique was used. There were divided into two groups, experimental and control. Each group consist of 20 subjects. The intervention was given daily for a period of 60 days to the experimental group. Data were analyzed by statistically package of social science (SPSS). In pretest, it was revealed that majority of the hypertensive clients out of 40 samples, 24(60%) were having to mild level of hypertension 16(40%) were having moderate

hypertension. In then after administration of drumstick leaves powder chutney over a 60 days, out of 40 samples 29(72.5%) were having normal blood pressure 11(27.5%) belongs to mild level of hypertension. The study result shows that drumstick leaves powder chutney was effect in reducing the level of blood pressure among hypertensive clients.

Sindhu S et.al,(2013) conducted a study on effectiveness of moringaoleifera in treating iron deficiency anemia in women of reproductive age group at Bangalore total 60 anemic women were selected between the age group of 15-45years with the use of simple random sampling. 30 women were in experimental group and 30 women in control group. For experimental group they provided 100gm of moringaoleifera and jaggery for 30 days. The posttest value was higher than the pretest value t=4.109. So they concluded that moringaoleifera and jaggery has significantly improved the hemoglobin level

Prasanna Kumar K.et.al (2013) conducted a study effect of moringa oleifera on blood glucose level in diabetic obese people in Guntur, Andra Pradesh. True experimental design was used. Sample size was 200 purposive sampling technique was used. Data were collected used by Glucometer. Data were analyzed by spss. The study finding revealed that the percentage decrease in serum LDL levels was 30.94% LDL-lowering action of the moringa oleifera leaf powder was found to be significant ($p< 0.05$) in serum.

Micheal Ples et.al (2012) conducted a comparative study on effects of moringa oleifera lam tea on normal and hyperglycemic patients in Asia. Experimental design was used in that study. Sample size was 45 purposive sample technique was used. Data were collected by Glucometer. Data were analyzed by using the t-test for

the normal group and wilcox on-signed-ranked test for the hyperglycemic group. Statistical computations were done using the statistical package. The study finding revealed that after taking tea, the blood sugar levels changed for both groups. Generally, the blood sugar levels were lower with a mean value of 102.62mg/dl for the 43 respondents. The variability of measurements of sugar levels 2 hours after taking the tea. There was an increased variability of measurements in the hyperglycemic group.

CHAPTER - III

METHODOLOGY

Introduction:

Research methodology is the way to systematically solve the research problem methodology occupies a key position as for as research documentation is concerned. It may be understood as a science of studying how research is done. It involves the systematic procedure by which the researcher starts from the initial identification of the problem to its final conclusion.

The study was intended to assess the effect of Miracle leaves extract on Hemoglobin level among adolescent girls with anemia between the age group of (13-15years).

The research methodology includes research approach, research design, setting, population, sampling, and section criteria, development of tool and description of tool.

Research approach:

In this study, the investigator used quantitative approach and the study was intended to assess the effect of Miracle leaves extract on hemoglobin among adolescent girls with anemia.

Research Design:

The research design used in this study was quasi experimental design.

E $O_1 \times O_2$

C O_1 - O_2

E - Experimental group

O_1 -pre test assessment of anemia

X - Intervention

O_2-post test assessment of anemia

C- Control group

_ No intervention

Setting:

The study was conducted in Arunachalam Higher Secondary School at Thiruvattar.

Population:

Target Population:

The target population for the study was adolescent girls with anemia.

Accessible population:

Accessible population for the study was adolescent girls (13-15years) with anemia who fulfill the inclusion criteria.

Setting of the study:

This study was conducted in Arunachalam Higher secondary school at Thiruvattar in Kanyakumari District. The school is 2Km away from Thiruvattar bus stop, and 2Km away from Sree Mookambika College. Total strength of the school is 1159 students. There is 72 students' in 10^{th} standard, 69 students in 9^{th} standard and 64 students in 8^{th} standard.

Sample size:

The study sample was 60 adolescent girls.

Sampling Technique:

Purposive sampling techniques were adopted for the study. The sample was selected on the basis of inclusion and exclusion criteria.

Sample selection criteria:

Inclusion criteria:

- Adolescent girls between the age group of 13-15years.
- Adolescent girls who are interested to participate in this study.
- Adolescent girls who are coming under the criteria of mild and moderate anemia by using Anemia Assessment Check List.
- Adolescent girls with the hemoglobin levels between 8-11.9gm/dl.
- Adolescent girls present during the study period.
- Adolescent girls who attained menarche.
- Adolescent girls who have regular menstrual cycle.
- Adolescent girls who have the duration of menstruation less than 7 days.

Exclusion criteria:

- Adolescent girls who have history of bleeding disorder like hemophilia or other major illness like leukemia and systemic disease.
- Adolescent girls who have psychologically depressed.
- Adolescent girls who are allergic to Miracle leaves extract.
- Adolescent girls who are receiving any other alternative treatment for anemia.

Data collection Tool:

The data collection instrument used for this study was digital hemoglobinometer. After wide reading, researcher used the tool as per following:

Section: A Demographic variables:

Demographic data consist of 13 items seeking information about:

- ❖ Age
- ❖ Education
- ❖ Religion
- ❖ Food habits
- ❖ Age at menarche
- ❖ Duration of menstrual cycle
- ❖ Education of Father
- ❖ Education of Mother
- ❖ Occupation of Father
- ❖ Occupation of Mather
- ❖ Type of Family
- ❖ Monthly income of parents
- ❖ Source of health information

Section: B

Anemia assessment check list

Anemia Assessment Check List to assess the severity of anemia among adolescent girls. It was prepared by the researcher, coexisting of 15 clinical symptoms related to anemia. The features were given score of '4'marks for always, '3'marks for frequently, '2'marks for occasionally and '1'mark for rarely.

SCORE	INTERPRETATION
46-60	SEVERE ANEMIA
31-45	MODERATE ANEMIA
1-30	MILD ANEMIA

Section: C

The researcher used a digital Hemoglobinometer to assess the level of hemoglobin and then categorized the subjects as healthy, mild, moderate and severe Anemia.

The Level of Anemia is classified as,

Above 12gm/dl - Healthy

10-11.9gm/dl - Mild anemia

8-9.9gm/dl - Moderate anemia

Below 8gm/dl - Severe anemia

Testing of Tool:

Validity:

The tool given to 5 experts from the field of Pediatric Nursing. Appropriate modification and correction were made and the tool was finalized.

Reliability:

Reliability of the tool was identified by test retest method using spearman rank correlation formula. An Anemia assessment check list r=value is 0.7 and digital Hemoglobinometer r=1 hence the tool was reliable.

Pilot study:

Pilot study was help to find out the feasibility and practicability of the Research Study. The pilot study was conducted in Govt. Higher Secondary School at Kuzhithurai in Kanyakumari District. Distance between Mookambika collage and the school is 14Km. Prior written permission was obtained from the Headmistress. Oral consent was obtained from parents of each subjects. After self introduction, objectives of the study was explained to the parents as well as the subjects and obtained oral permission from each subjects. 6 samples were selected from 8^{th}, 9^{th} and 10^{th} standard. During the first day, pre test was done by using the Anemia Assessment Check List, and Hemoglobin level was checked with the help of Digital Hemoglobinometer. Miracle leaves extract was administer to experimental group at midmorning (9am) after breakfast. After that post test was done by using the digital Hemoglobinometer.

Data collection procedure:

A Prior written permission was obtained from the Headmaster of Arunachalam Higher Secondary School at Thiruvattar. Oral consent was obtained from parents of each subjects. After self introduction, objectives of the study was explained to the parents as well as the subjects and obtained oral permission from each subjects. Based on the inclusion criteria the samples were selected by purposive sampling technique. Out of 60 samples, was selected 30 in an experimental group and 30 in control group (8^{th}, 9^{th} and 10^{th} standard students). Pre test was conducted in both group by using the Anemia Assessment Check List, and Hemoglobin level was checked with the help of digital Hemoglobinometer. Miracle leaves extract was administered to experimental group at midmorning (9am) after breakfast for 20 days. After 5^{th} day of interventionpost test was done by using the digital Hemoglobinometer.

Plan for data analysis:

The collected data is planned to be analyzed using descriptive and inferential statistics, such as percentage means, t-test and chi-square test.

Sl. no	Data analysis	Method	Remarks
01.	Descriptive statistics	• Mean • Standard Deviation	Describe Demographic Variable. To find out positive square root of means of standard deviation.
02.	Inferential statistics	• 't' -test • Chi square test	To find the significant difference between two groups. To find the association between two events.

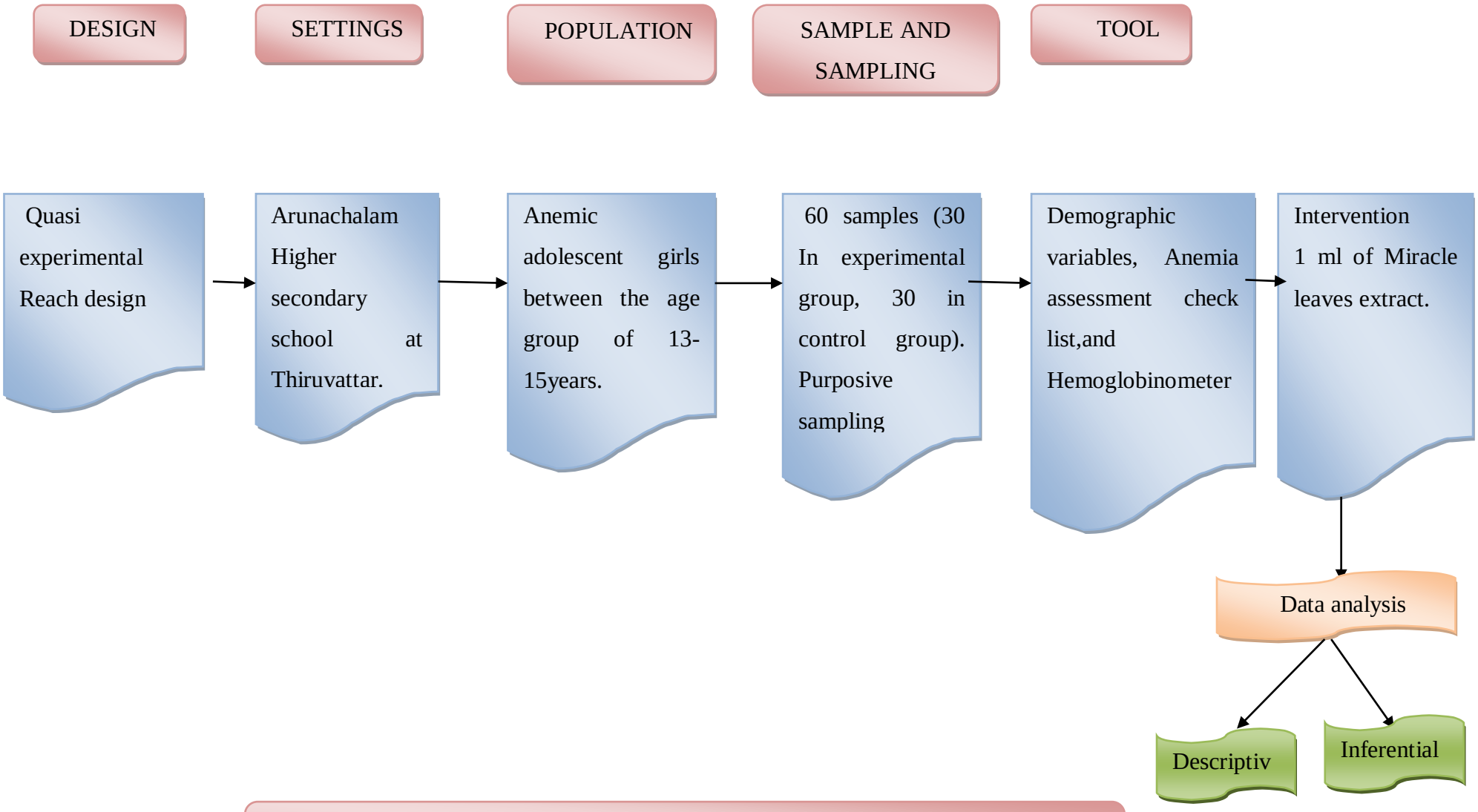


Figure: 2 **Schematic Representation of Research Design**

CHAPTER-IV

DATA ANALYSIS AND INTERPRETATION

INTRODUCTION:

This chapter deals with the description of statistical analysis and interpretation of data. Analysis and interpretation of data is the most important phase of the research process. The data collections were analyzed by using descriptive and inferential statistics. The test score was analyzed by statistical mean and standard deviation the significance difference of mean scores were interpreted by‘t’ test.

The effect of Miracle leaves extract for anemia was assessed by‘t’ test. The association between demographic variable and level of anemia was studied by chi-square test.

Presentation of Data:

The data analyzed are presented under the following section.

Section: A:

This section deals with the distribution of the study subject’s based on demographic variables.

Section: B:

This section deals with the pre and post test level of hemoglobin among adolescent girls.

Section : C

This section deals with the comparison of pretest and post test level of hemoglobin among adolescent girls.

Section : D

This section deals with the effect of Miracle leaves extract on hemoglobin level among adolescent girls.

Section: E

This section deals with the association between the demographic variables and level of hemoglobin among adolescent girls.

Section: A:

This section deals with the distribution of the study subject's based on their demographic variables such as Age, Education, Religion, Food habits, Age at Menarche, Duration of Menstrual Cycle, Education of Father, Education of Mother, Occupation of Father, Occupation of Mother, Type of Family, Monthly income of Parents, Source of health information.

Table: 1

Frequency and Percentage Distribution of Demographic variables. (N:60)

Sl. No	Demographic Variables	Experimental group		Control group	
		f	%	f	%
1	Age				
	(a) 13 years	19	63	0	0
	(b) 14 years	11	37	11	37
	(c) 15 years	0	0	19	63
2	Education				
	(a) 8th Standard	19	63	0	0
	(b) 9th standard	11	37	0	0
	(c)10th Standard	0	0	30	100
3.	Religion				
	(a) Hindu	15	50	14	47
	(b) Christian	11	37	13	43
	(c) Muslim	4	13	3	10

4.	Food habits				
	(a) Vegetarian	6	20	5	17
	(b) Non –Vegetarian	24	80	25	83
5.	Age at Menarche				
	(a) 10-11 years	17	57	17	57
	(b) 12-13 years	13	43	10	33
	(c) 14-15 years	0	0	3	10
6.	Duration of Menstrual cycle				
	(a) 2-4 days	12	40	21	70
	(b) 5-7 days	18	60	9	30
7.	Education of Father				
	(a) Primary school Education	19	63	17	57
	(b) Secondary School Education	8	27	7	23
	(c) Higher School Education	3	10	6	20
8.	Education of Mother				
	(a) Primary school Education	17	57	11	37
	(b) Secondary School Education	7	23	9	30
	(c) Higher School Education	6	20	10	33
9.	Occupation of Father				
	(a) Coolie	18	60	15	50
	(b) Private Employee	7	23	11	37
	(c) Government Employee	5	17	4	13

10	Occupation of Mother				
	(a) Coolie	18	60	16	53
	(b) Private Employee	10	33	11	37
	(c) Government Employee	2	7	3	10
11	Type of Family				
	(a) Nuclear Family	15	50	16	53
	(b) Joint Family	11	37	12	40
	(c) Single Parented Family	0	0	0	0
	(d) Extended Family	4	13	2	7
12	Monthly Income of Parents				
	(a) Rs. <5000/-	9	30	6	20
	(b) Rs. 5001/- - 10,000/-	13	43	16	53
	(c) Rs. >10,0001/-	8	27	8	27
13	Source of Health Information				
	(a) Parents	12	40	8	27
	(b) Friends	3	10	3	10
	(c) Medias	6	20	6	20
	(d) Teacher	7	23	9	30
	(e) Relatives	2	7	4	13

Table 1 represented that, Among Age in an experimental group majority of girls belong to 13years (63%), In control group girls belong to 15years (63%).According to Education of subjects in an experimental group, most of the girls are in 8^{th} standard (63%) and in control group 100% of girls are in 10^{th} standard. About Religion of subjects 50% in experimental group and 47% in control group are Hindhus. According to the Food Habits 80% in an experimental group and 83% in

control group are Non vegetarian. Regarding Age at Menarche 57% in both experimental and control group are among 10-11years. According to the Duration of Menstrual cycle60% in an experimental group had duration of 5-7days and 70% in control group had duration of 2-4days. About Education of Father 63% in an experimental group and 57% in control group had Primary School Education. According to Education of Mother 57% in an experimental group and 37% in control group had Primary School Education. Regarding Occupation of Father 60%in an experimental group and 50%in control group were Coolie. According to Occupation of Mother 60%in an experimental group and 53%in control group were Coolie. Regarding Type of Family 50%in an experimental group and 53%in control group were Nuclear Family. Among Monthly Income of Parents 43% in an experimental group and 53% in control group had Monthly Income of Parents Rs.5001/-10,000/. According to Source of Health Information, 40%had Heath Information from Parents and in control group 30% had Health Information from Teachers.

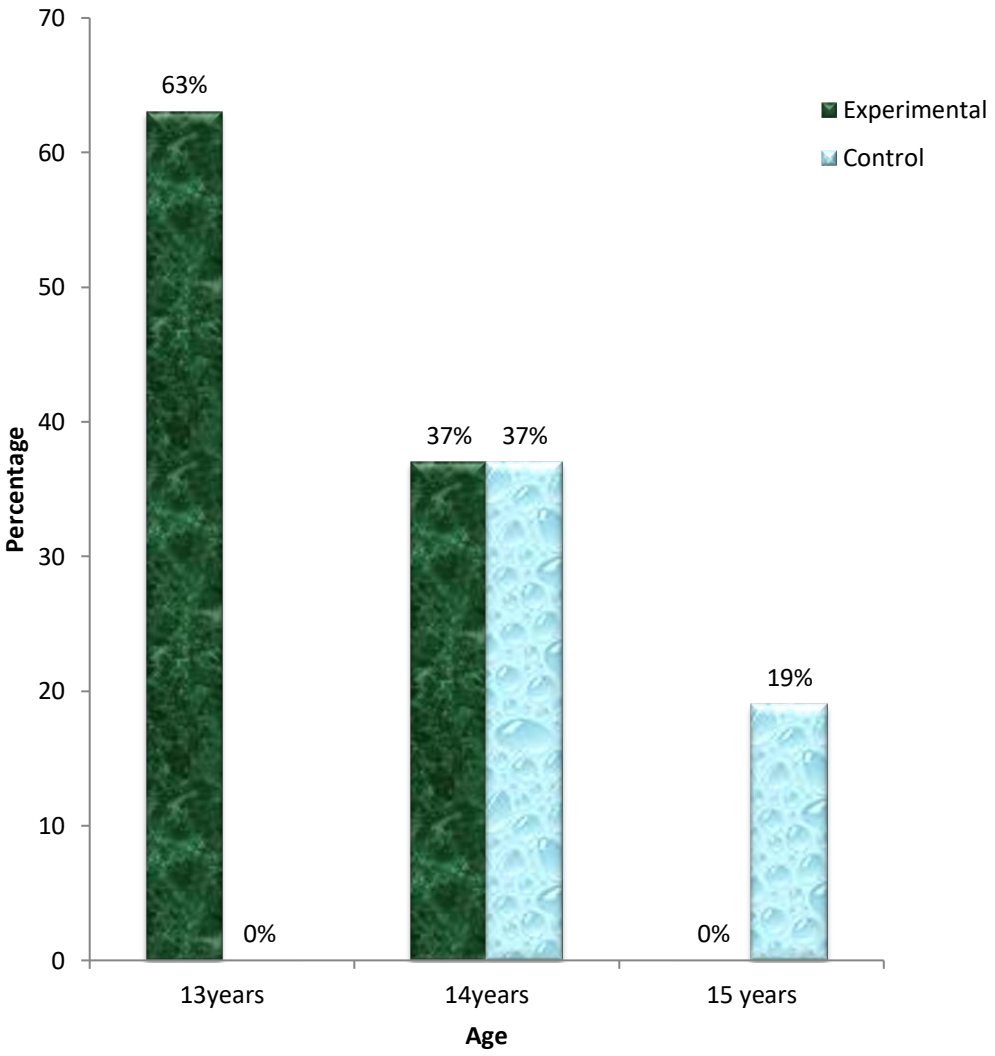


Figure3: Distribution of samples According to Age

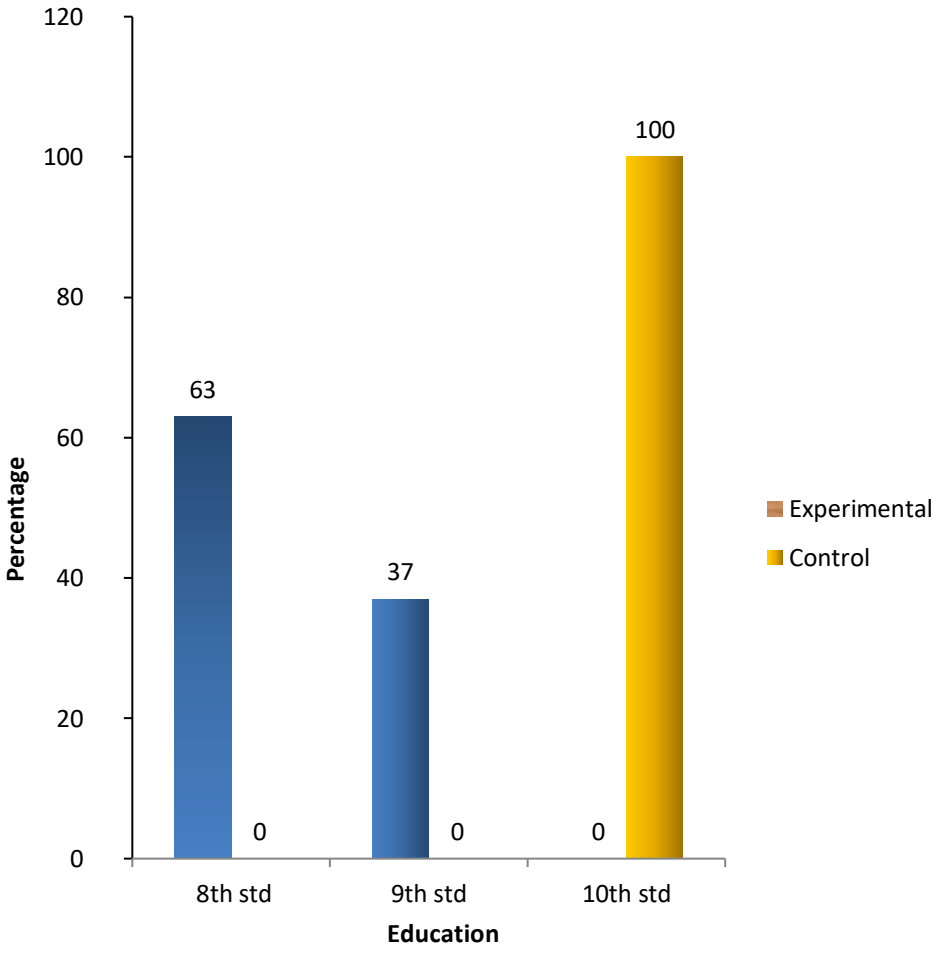


Figure 4: Distribution of samples ccording to Education

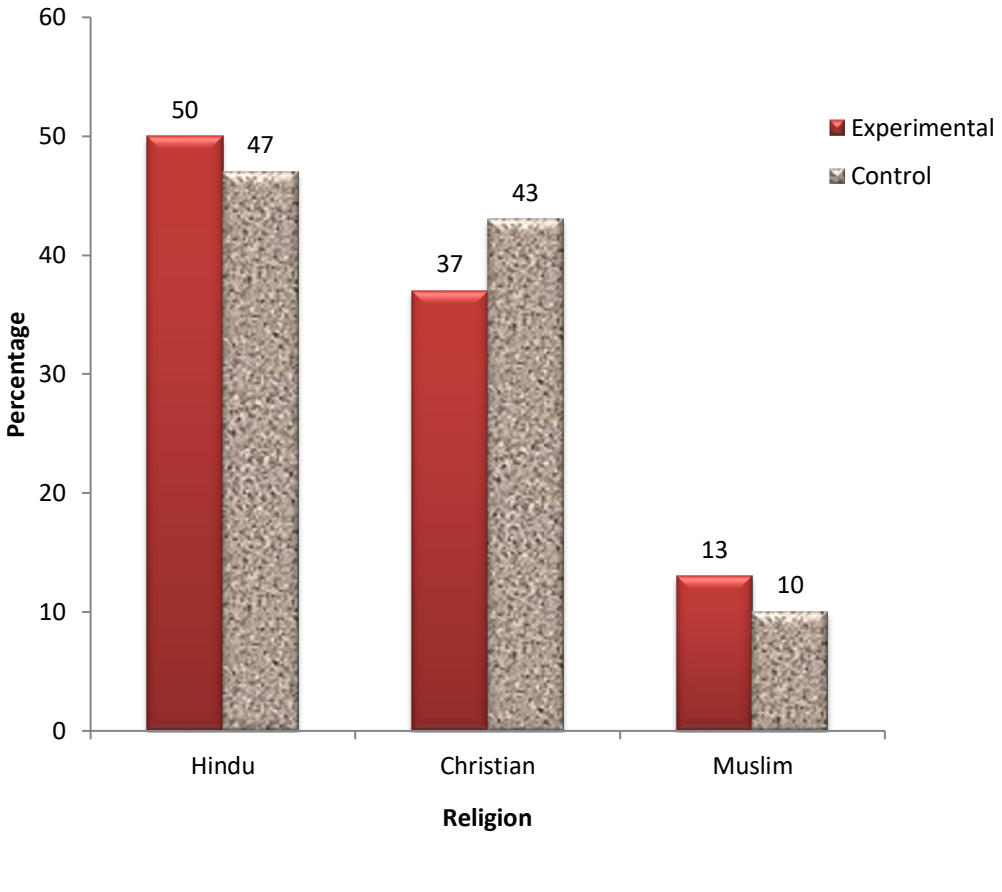


Figure 5: Distribution of Samples According to Religion

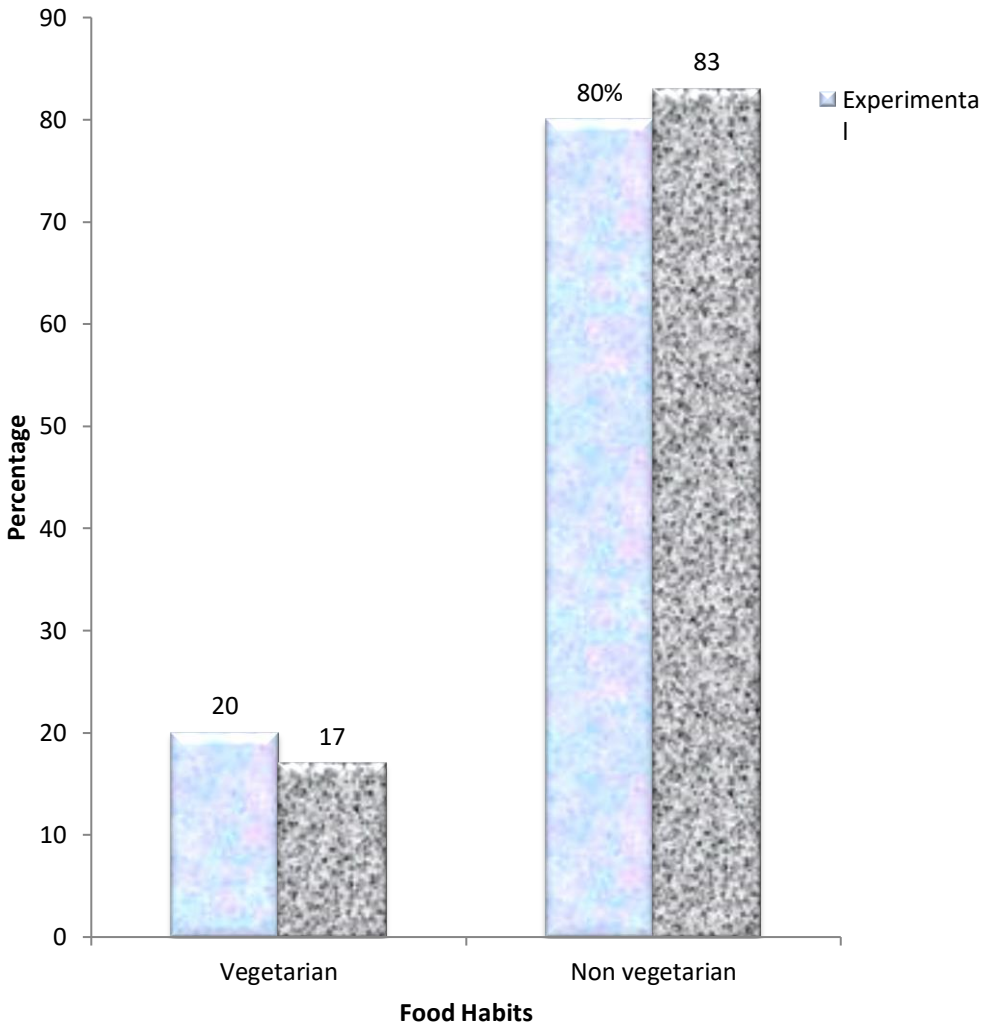


Figure 6: Distribution of Samples According to Food Habits

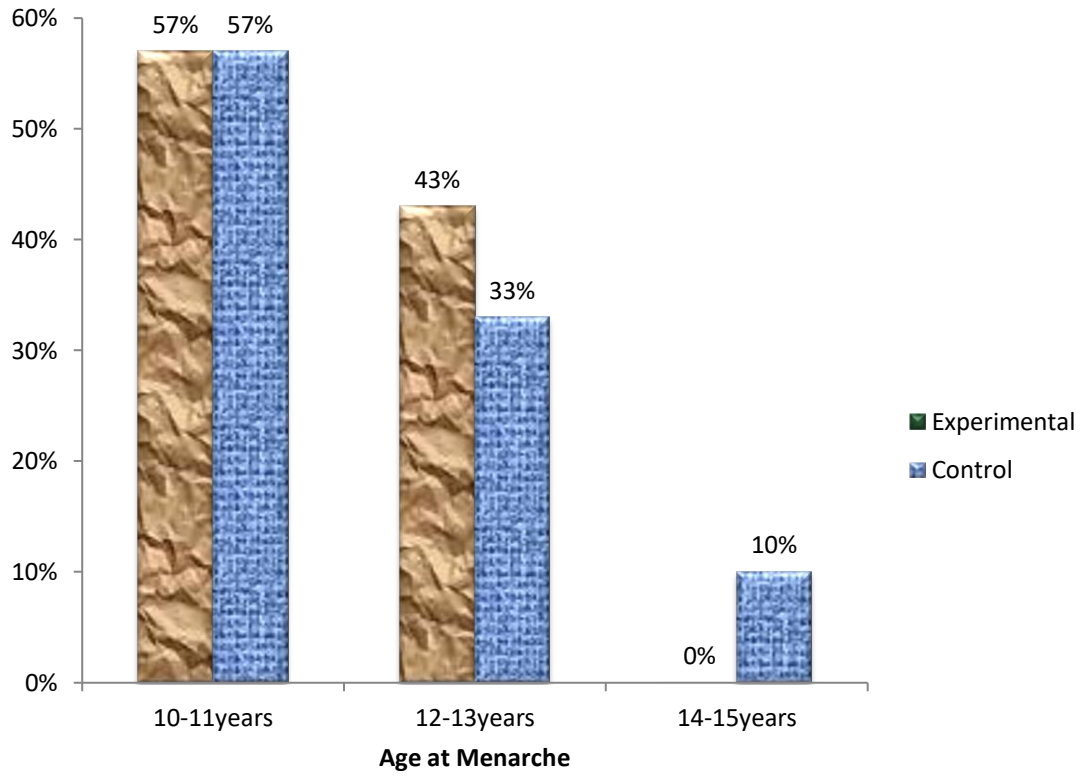


Figure 7: Distribution of Samples According to Age at Menarche

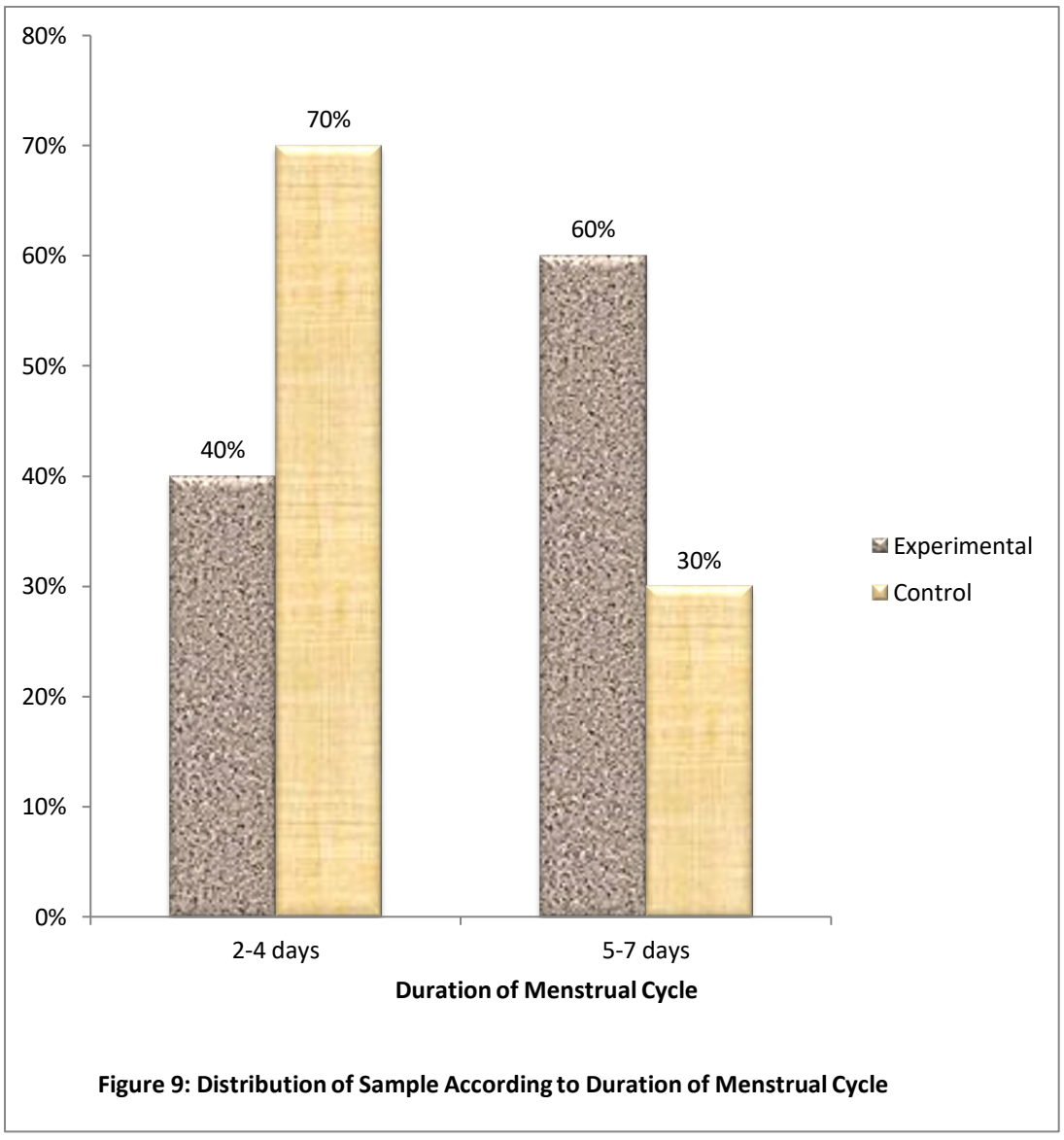


Figure 9: Distribution of Sample According to Duration of Menstrual Cycle

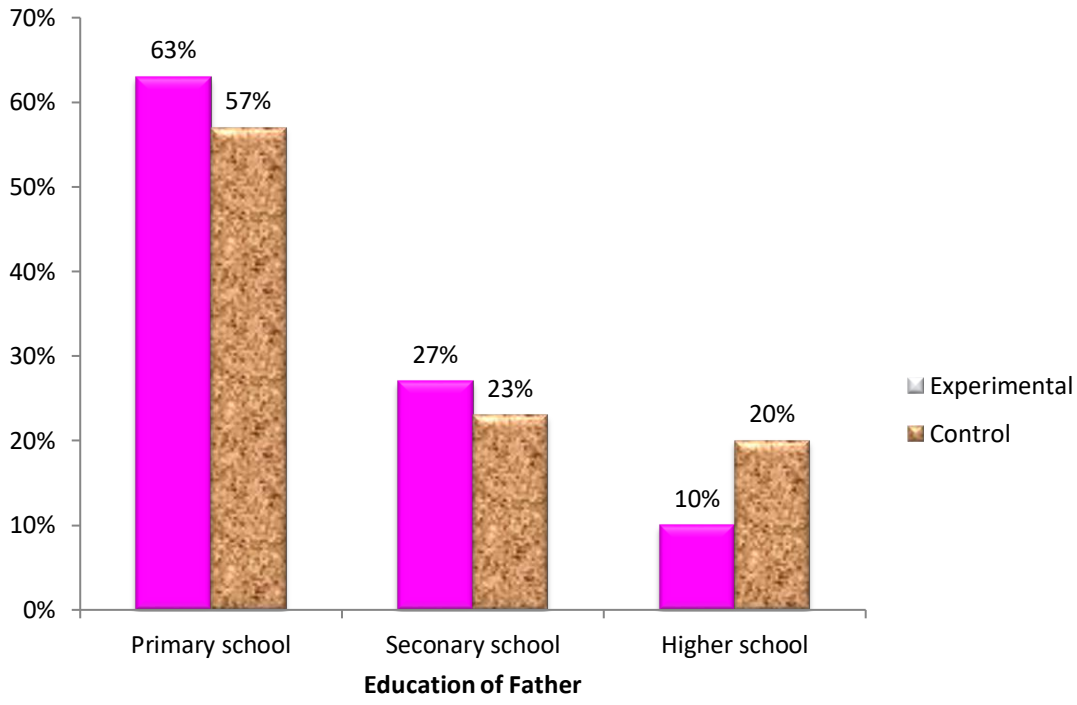


Figure 10: Distribution Samples According to Education of Father

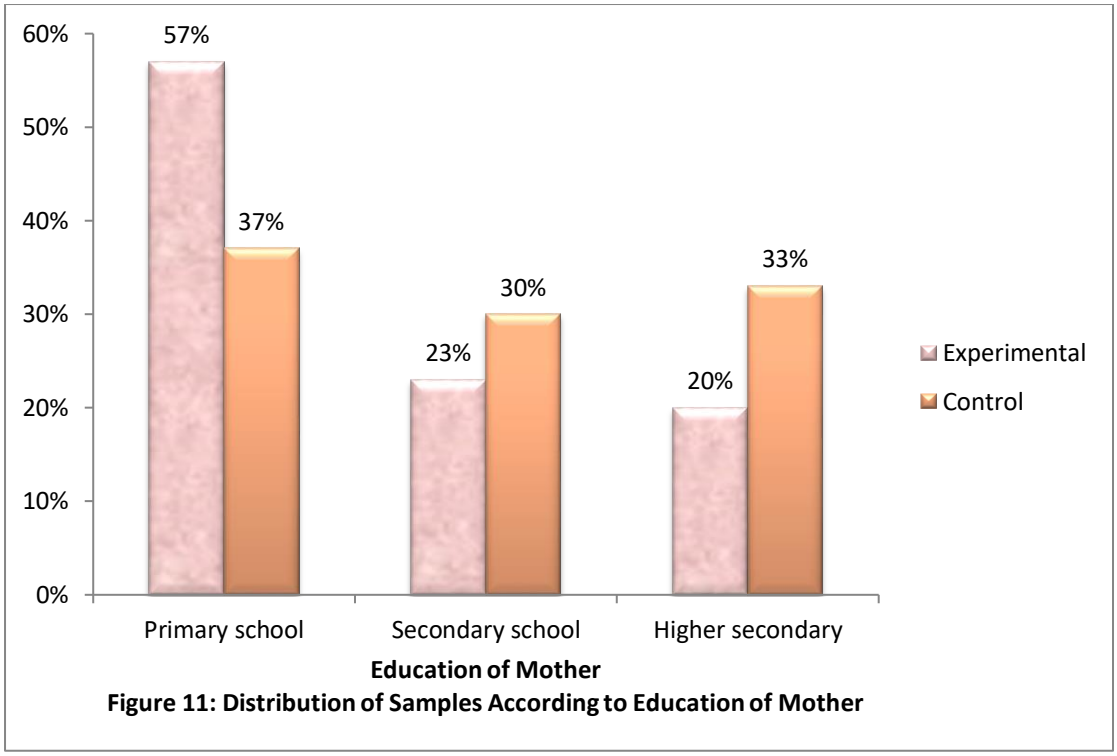


Figure 11: Distribution of Samples According to Education of Mother

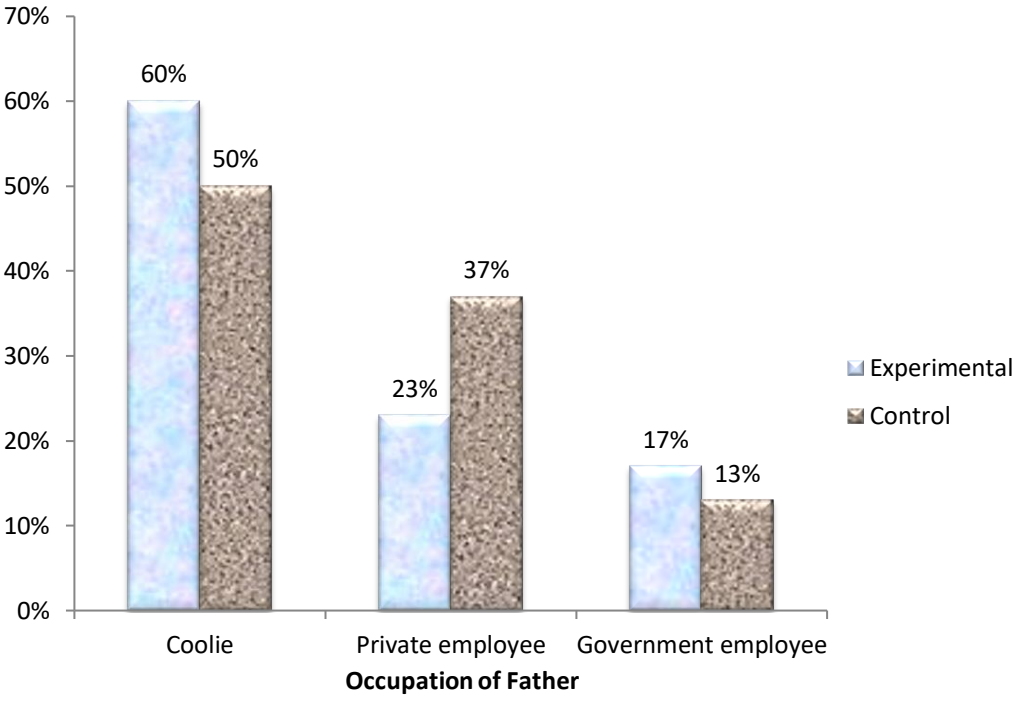


Figure 12: Distribution of Samples According to Occupation of Father

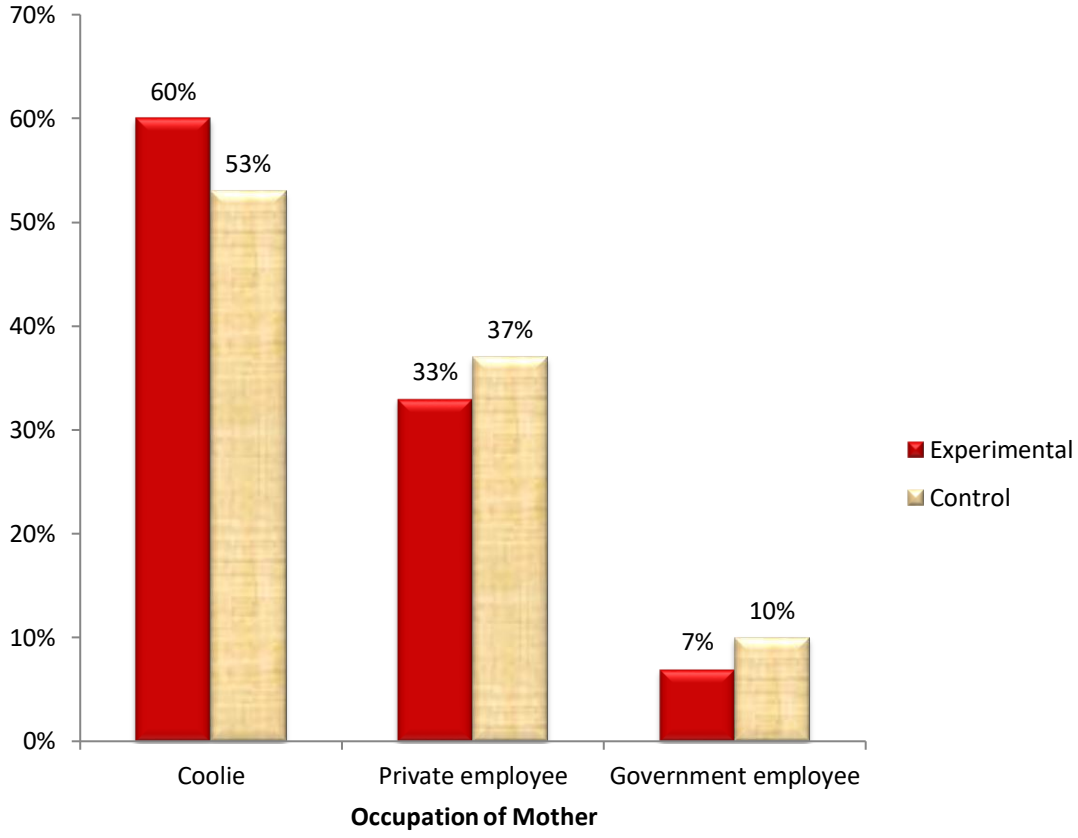


Figure 13: Distribution of Samples According to Occupation of Mother

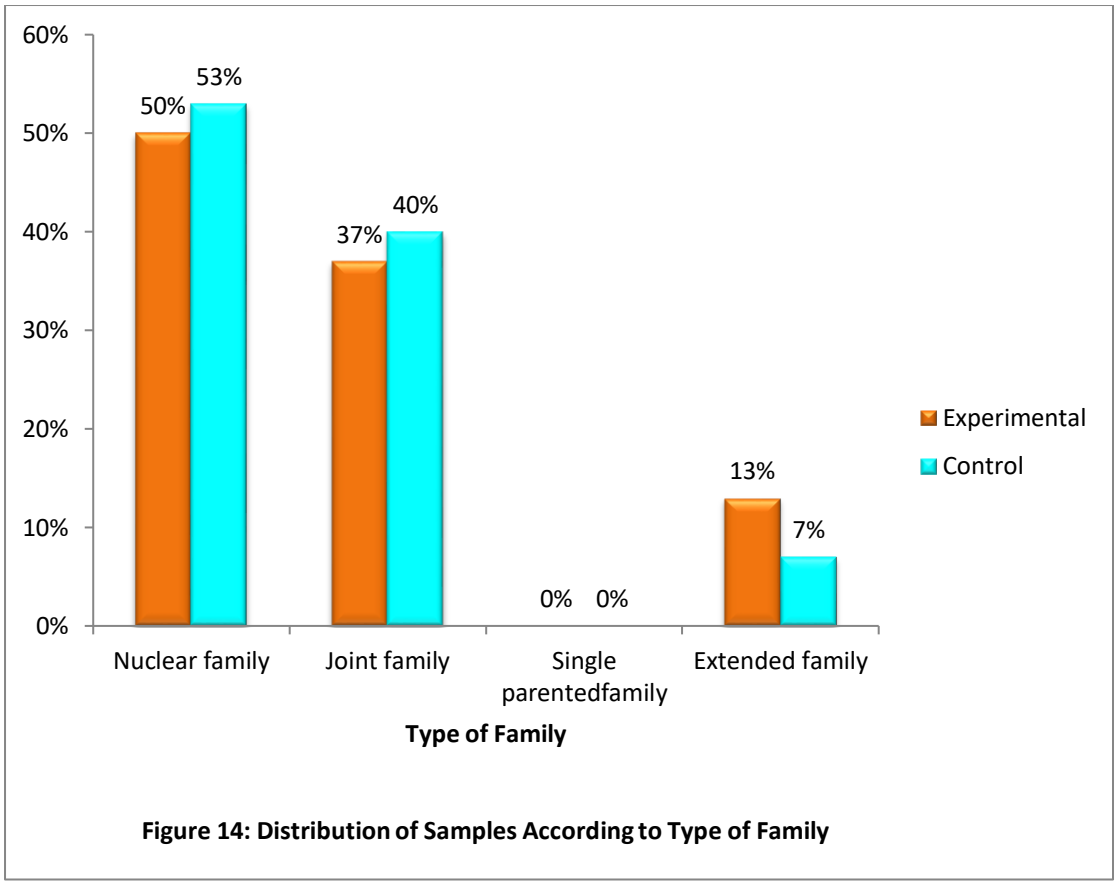


Figure 14: Distribution of Samples According to Type of Family

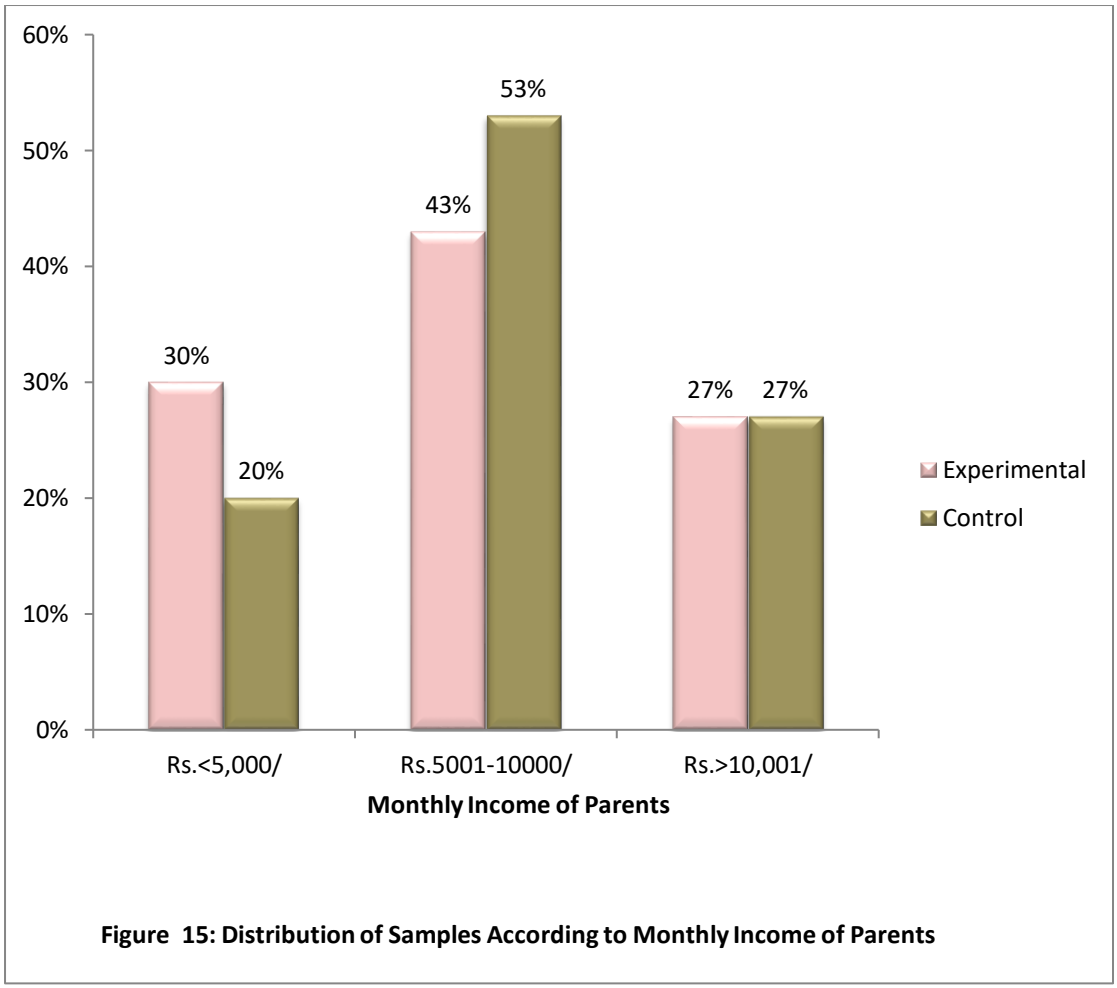


Figure 15: Distribution of Samples According to Monthly Income of Parents

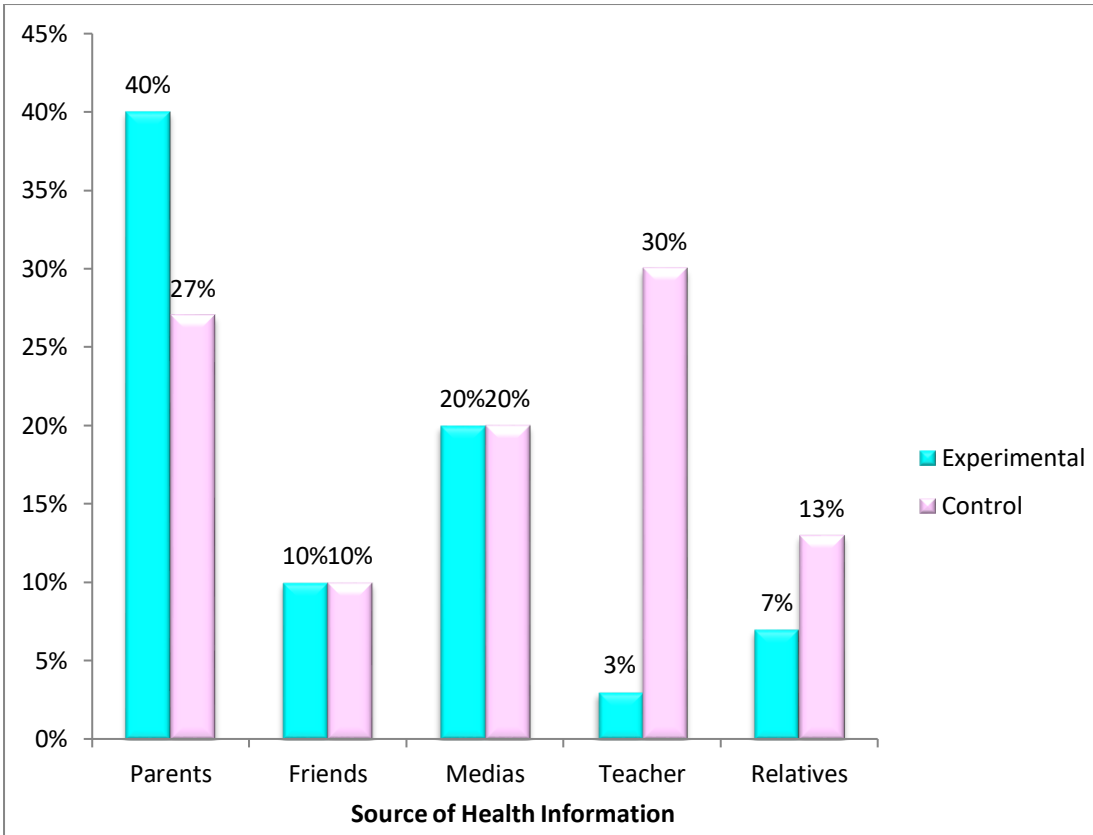


Figure 16: Distribution of Samples According to Source of Health Education

Section: B

This section deals with the pre and post test level of hemoglobin among adolescent girls in experimental and control group.

Table : 2

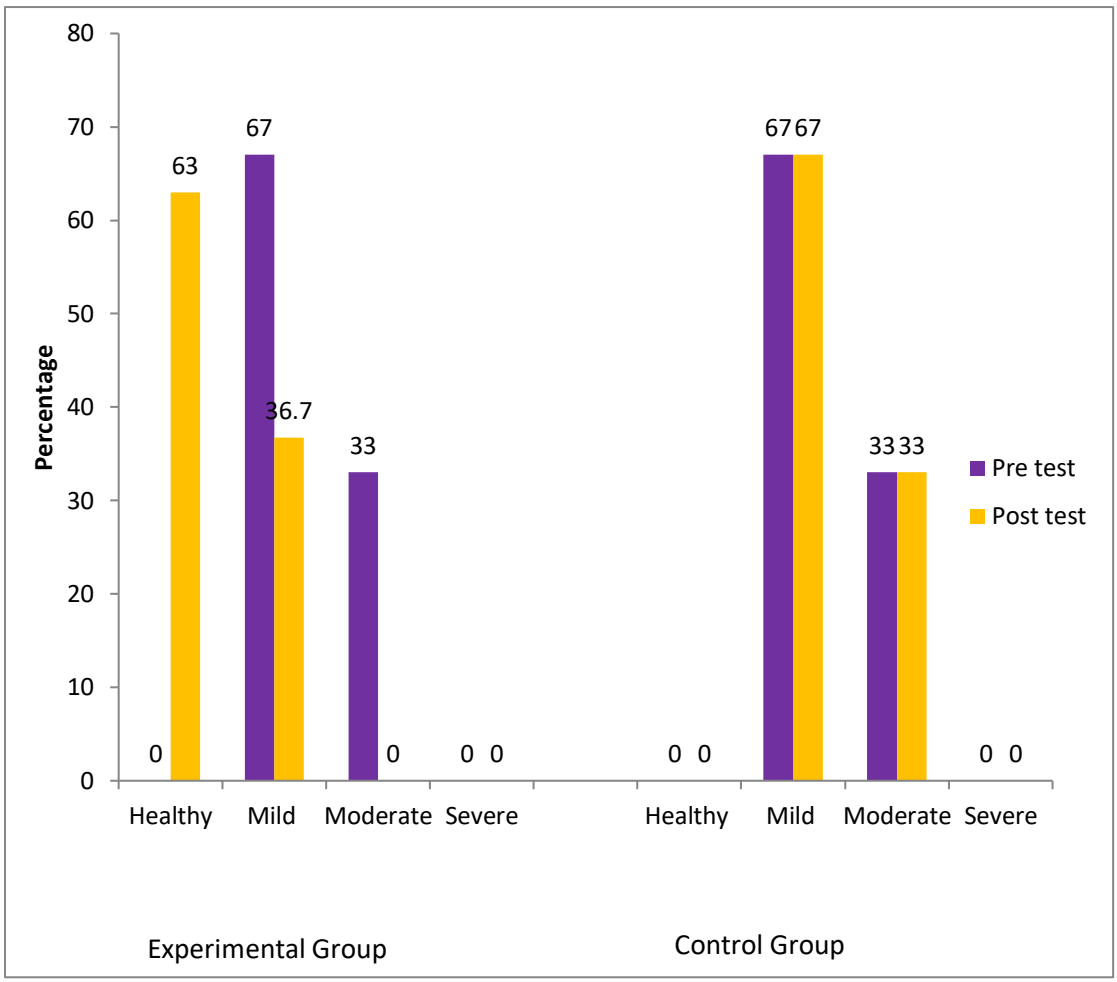
Pre and Post Test Level of Hemoglobin among Adolescent girls.

(N=60)

Level of Hemoglobin	Pre test		Post test	
	f	%	f	%
Experimental Group				
Healthy	0	0	19	63.3
Mild Anemia	20	67	11	36.7
Moderate Anemia	10	33	0	0
Severe Anemia	0	0	0	0
Control Group				
Healthy	0	0	0	0
Mild Anemia	20	67	20	67
Moderate Anemia	10	33	10	33
Severe Anemia	0	0	0	0

The above table shows that during pretest in an experimental and control group,(0%) were healthy, (67%) had mild anemia (33%) had moderate anemia and none of the samples had severe anemia.

During post test in an experimental (63.3%) were healthy, (36.7%) had mild anemia and none of the samples had moderate and severe anemia. In control group (0%) of the sample were healthy,(67%) samples had mild anemia (33%) had moderate anemia and none of the samples had severe anemia.


80
70
60
50
40
30
20
10
0
Percentage
63
67
36.7
33
0
0 0
0 0
67 67
33 33
0 0
Pre test
Post test
Healthy
Mild
Moderate
Severe
Healthy
Mild
Moderate
Severe
Experimental Group
Control Group

Section C:

This section deals with the comparison of pretest and post test level of hemoglobin among adolescent girls.

Table: 4

Comparison of pretest and post test level of Hemoglobin

(N=60)

Sl No	Group	Pre test		Post test		Mean Difference	't'	df	Table value
		Mean	SD	Mean	SD				
1.	Experimental group	11.7	1.51	12	0.89	0.3	13	29	2.05
2.	Control group	10.7	0.9	10.3	0.7	0.4	1	29	2.05

Significance $p<0.05$

The above table shows the Comparison of pretest and post test level of hemoglobin in experimental group mean score is 11.7, SD is 1.51, mean difference is 0.3 and't' value is 13 higher than the p- value 2.05.

In control group mean score is 10.7, SD is 10.3 mean difference is 0.4 and't' value is 1 less than the T- value 2.05.

Section: E

This section deals with the effect of Miracle leaves extract on hemoglobin level among adolescent girls

Table: 5

Effect of Miracle leaves extract on hemoglobin level

(N:60)

Category	Experimental group		Control group		Mean Difference	't' value	df	T value
	Mean	SD	Mean	SD				
Level of Hemoglobin	12	0.89	10.3	0.77	1.7	6.12	58	2

Significance $p<0.05$

The above table shows that the post test Mean Hemoglobin score in the experimental group is 12 and SD is 0.89. In control group Mean score is 10.3 and SD is 0.77. The Mean difference is 1.7. The calculated' value 6.12 is higher than the table value 2.0. Hence there is an improvement in level of Hemoglobin after administration of Miracle leaves extract among Adolescent girls.

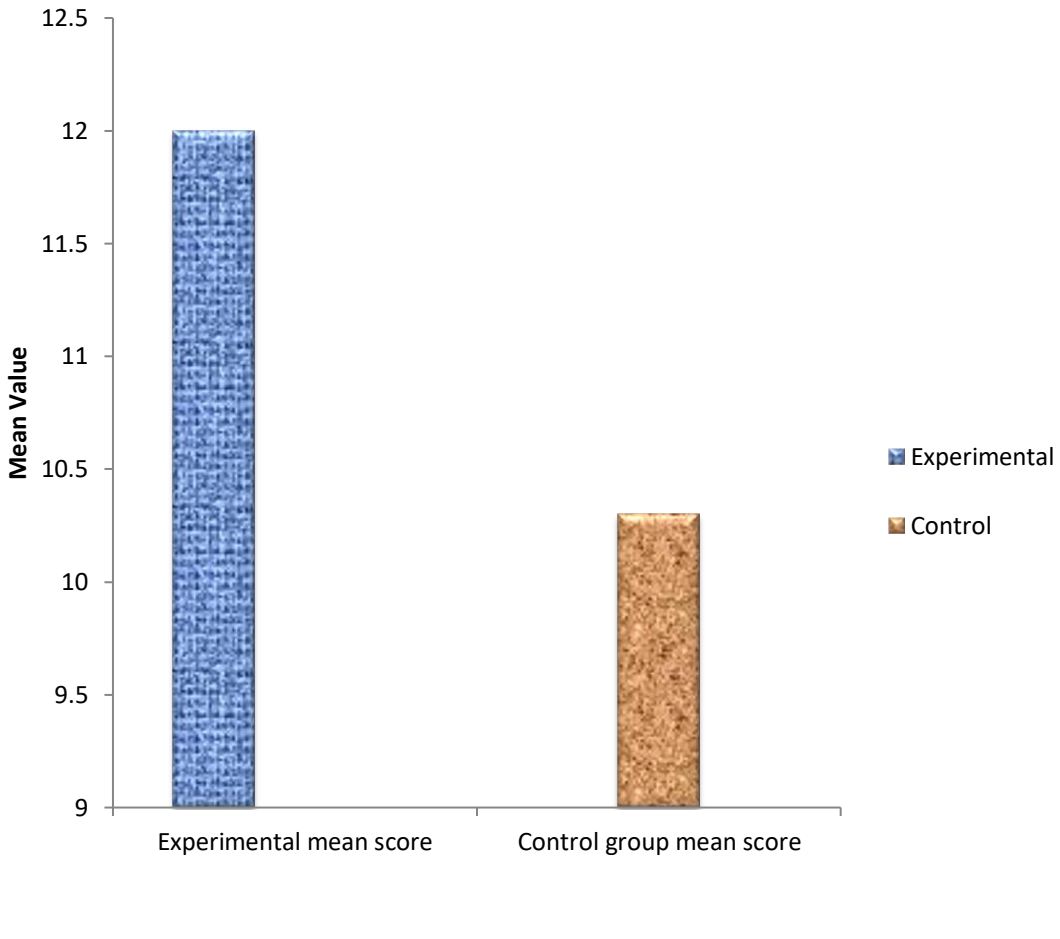


Figure 21: Effect of Miracle leaves extract on Hemoglobin level

Section: F:

This section deals with the association between the level of Hemoglobin with selected demographic variables such as Age, Education, Religion, Food habits, Age at menarche, Duration of Menstrual Cycle, Education of Father, Education of Mother, Occupation of Father, Occupation of Mother, Type of Family, Monthly income of Parents, and Source of health information.

Table: 6

Association between demographic variables with the level of Hemoglobin with selected subjects (N=60)

S. No	Demographic variables	Mild anemia	Moderate anemia	λ^2	df	Table value
1	Age					
	a.13 years	17	2			
	b.14 years	14	8	7.9*	2	5.991
	c.15 years	9	10			
2	Education					
	a.8th standard	17	2			
	b.9th standard	4	7	9.15*	2	5.991
	c.10th standard	19	11			

3	Religion					
	a. Hindu	21	8			
	b. Christian	16	6	9.02*	2	5.991
	c .Muslim	1	6			
4	Food habits					
	a. Vegetarian	7	2	0.53	1	3.8841
	b. Non – vegetarian	33	18			
5	Age at Menarche					
	a. 10 - 11 Years	28	6			
	b. 12- 13 Years	10	13	9.4*	2	5.991
	C.14-15years	2	1			
6	Duration of Menstrual cycle					
	a. 2-4days	28	5			
	b. 5-7 days	12	15	10.9*	1	3.8841
7	Education of Father					
	a. Primary School Education	24	12			
	b. Secondary School Education	12	3	3.1	2	5.991
	c. Higher School Education	4	5			
8	Education of Mother					
	a. Primary School Education	21	7			
	b. Secondary School Education	11	5	2.96	2	5.991
	c. Higher School Educational	8	8			

9	Occupation of Father					
	a. Coolie	30	3			
	b. Private Employee	8	10	19.2*	2	5.991
	c. Government Employee	2	7			
10	Occupation of Mother					
	a. Coolie	21	13			
	b. Private Employee	15	6	0.83	2	5.991
	c. Government Employee	4	1			
11	Type of Family					
	a. Nuclear Family	23	8			
	b. Joint Family	16	7	11.25*	3	7.815
	c. Single Parented Family	0	0			
	d. Extended Family	1	5			
12	Monthly Income of Parents					
	a. Rs.<5000/-	1	14			
	b. Rs. 5001- 10, 000/-	25	4	32.29*	2	5.991
	c. Rs.>10, 001/-	14	2			
13	Source of Health Information					
	a. Parents	15	5			
	b. Friends	3	3			
	c. Medias	4	8	10.47*	4	9.488
	d. Teacher	14	2			
	e. Relatives	4	2			

* Significance at $p<0.05$

The study was to find out a significant association between the level of Hemoglobin among adolescent girls with selected demographic variables such as Age, Education, Religion, Age at menarche, Duration of menstrual cycle, Occupation of Father, Type of family, Monthly income and Source of information. So the research hypothesis(H_2) was accepted.

CHAPTER-V

RESULTS AND DISCUSSION

This chapter gives a brief account of the presents study including result and discussion compared with some of the relevant studies done in different setting.

The present study was to assess the effect of Miracle leaves extract on Hemoglobin level among adolescent girls with anemia in Arunachalam Higher Secondary School at Kanya Kumari District". The level of Hemoglobin was assessed by digital Hemoglobinometer. The result and discussion of the study are based on the findings obtained from the statistical analysis.

Objectives of Study

1. To assess the pre and post test interventional level of Hemoglobin among adolescent girls in experimental and control group.
2. To determine the effect of Miracle leaves extract on anemia among adolescent girls in an experimental group.
3. To find out the association between the Hemoglobin level of adolescent girls with selected demographic variables such as Age, Education, Religion, Food Habits, Age at Menarche, Duration of Menstrual Cycle, Education of Father, Education of Mother, Occupation of Father, Occupation of Mother, Type of Family, Monthly Income of Parents and Source of Health Information.

Distribution of selected characteristics of study subjects:

Table 1 Represented among Age in an experimental group majority of girls belong to 13years (63%), In control group girls belong to 15years (63%).According to

Education of subjects in an experimental group, most of the girls are in 8th standard (63%) and in control group 100% of girls are in 10th standard. About Religion of subjects 50% in experimental group and 47% in control group are Hindhus. According to the Food Habits 80% in an experimental group and 83% in control group are Non vegetarian. Regarding Age at Menarche 57% in both experimental and control group are among 10-11years. According to the Duration of Menstrual cycle60% in an experimental group had duration of 5-7days and 70% in control group had duration of 2-4days. About Education of Father 63% in an experimental group and 57% in control group had Primary School Education. According to Education of Mother 57% in an experimental group and 37% in control group had Primary School Education. Regarding Occupation of Father 60%in an experimental group and 50%in control group were Coolie. According to Occupation of Mother 60%in an experimental group and 53%in control group were Coolie. Regarding Type of Family 50%in an experimental group and 53%in control group were Nuclear Family. Among Monthly Income of Parents 43% in an experimental group and 53% in control group had Monthly Income of Parents Rs.5001/-10,000/. According to Source of Health Information, 40%had Heath Information from Parents and in control group 30% had Health Information from Teachers.

The first objective of the study was to assess the pre and post test interventional level of Hemoglobin among adolescent girls in experimental and control group.

Table 2 shows that in an experimental and control group the samples (0%) had healthy, 67% had mild anemia, 33% had moderate anemia and none of the samples had severe anemia.

The study finding was congruent with the study conducted by Sanjeev M (2008) conducted a cross sectional study on prevalence of anemia among rural population living around the rural health center in Nagpur. Data were collected by using convenient sampling method. Hemoglobin estimation done by sahli's method. Data was analyzed by using descriptive and inferential statistical technique. The study findings reveal that out of 296 subjects, 104(35.1%) were found to be anemic. Out of 104 subjects, 72 subjects (69.2%) had mild anemia while 32 subjects (30.8%) had moderate anemia. None of these subjects had severe anemia.

Table: 2 shows that in an experimental group (66.6%) of the samples were healthy, (36.6%) samples had mild anemia, (0%) had moderate anemia and none of the samples had severe anemia. In control group (0%) of the samples had healthy, (67%) samples had mild anemia, (33%) had moderate anemia and none of the samples had severe anemia.

The study finding was congruent with the study conducted by by M. Ramzi et .al (2008) conducted a cross sectional study on prevalence of anemia among rural population of adolescent girls in Southern Iran. Data were collected by using convenient sampling method. Hemoglobin estimation done by sahli's method. Data was analyzed by using descriptive and inferential statistical technique. The study findings reveal that out of 363 subjects, 332 subjects (85.7%) had mild anemia while 31 subjects (14.5%) had moderate anemia. None of these subjects had severe anemia.

The second objective of the study was to determine the effect of Miracle leaves extract on anemia among adolescent girls in experimental group

Table: 3 shows that in an experimental group mean score is 12 and SD is 0.89. In control group Mean score is 10.3 and SD is 0.77. The Mean difference is 1.7. The

calculated' value 6.12 is higher than the table value 2.0. Hence there is an improvement in level of Hemoglobin after administration of Miracle leaves extract among Adolescent girls.

The study finding was congruent with the study conducted by Resmi. S et. al (2016) cross sectional study was conducted to assess the effectiveness of herbal extract in enhancing the level of hemoglobin among adolescent girls in selected higher secondary schools at Bangalore. Sample size was 20 probability sampling technique was used. Data were collected with the help of lab technician. Data were analyzed by SPSS. The result shows that experimental group post-test score was 11.63 and control group was 9.03. The calculated't' value was greater than the table value. Hence this study was statistically significant at $p<0.05$ level.

The third objective of the study was to find out the association between the Hemoglobin level of adolescent girls with selected demographic variables.

Table :4 shows that the Association between level of Hemoglobin among adolescent girls with selected demographic variables such as Age, Education, Religion, Age at Menarche, Duration of Menstrual cycle, Occupation of Father, Type of Family, Monthly Income of Parents and Source of Health Information. There is no association between Level of Hemoglobin among adolescent girls with selected Demographic variables such as, Food Habits, Type of Menstrual Cycle, Education of Father, Education of Mother and Occupation of Mother.

The study finding was congruent with the study A cross-sectional study was conducted by Joice. S, Datta SS et.al (2010) Prevalence of anemia among adolescent girls in Pondicherry. The sample size was 300. Purposive sampling technique was used for in this study. Hemoglobin level was measured by Sahli's method. Data analysis Data were analyzed by statistically package of social science (SPSS). The study findings revealed that association between anemia and demographic variables such as Age, Increasing academic year and Food habits.

CHAPTER-VI

SUMMARY, CONCLUSION, IMPLICATIONS, LIMITATIONS AND RECOMMENDATIONS

This chapter gives a brief account of the presents study along with the summary of the findings, conclusions, limitations of the study, implications and recommendations of the study.

Summary

Adolescence period is also a sensitive period particularly for girls. Most of them are having poor access to proper health care, nutrition and education. Girls typically start puberty around age 10 – 12 yrs and achieve their full adult height by the age of 15. Adolescent girls are at a high risk for anemia and malnutrition. Inadequate nutrition during adolescence can have serious consequence throughout the reproductive years of life. Anemia is a condition in which reduced hemoglobin levels leads to diminished oxygen carrying capacity that does not optimally meet the metabolic demands of the body.

In this contest of presents study attempts “A Study to assess the effect of Miracle leaves extract on Hemoglobin level among adolescent girls with anemia in Arunachalam Higher Secondary School at Kanya Kumari District”.

The present study approach was quantitative approach. The research design was quasi experimental design.

The study was conducted in Arunachalam Higher secondary school at Thiruvattar. The findings of the study revealed that the study was feasible and practicable.

The researcher adopted a quantitative approach with quasi experimental design. The study was conducted in Arunachalam Higher Secondary School at Thiruvattar. Out of 60 samples was selected, 30 in experimental group and 30 in control group (8^{th}, 9^{th} and 10^{th} standard students). Pre test was conducted in both groups by using the Anemia Assessment Check List, and Hemoglobin level was estimated by using digital Hemoglobinometer. Samples selected by purposive sampling technique for this study. Miracle leaves extract was administer to experimental group for 20days at midmorning (9am) after breakfast. After 5^{th} day of Intervention post test was done by using the digital Hemoglobinometer. The collect data were analyzed based on descriptive an inferential statistics.

Objectives Of The Study

1. To assess the pre and post test interventional level of Hemoglobin among adolescent girls in experimental and control group.
2. To determine the effect of Miracle leaves extract on anemia among adolescent girls in experimental group.
3. To find out the association between level of Hemoglobin among adolescent girls with selected demographic variables.

Hypotheses;

H_1- There is a significant improvement in hemoglobin level among adolescent girls consuming miracle leaves extract.

H_2-There is a significant association between level of hemoglobin and selected demographic variables.

Major Findings:

The collected data were analyzed based on descriptive and inferential statistics according to the above said objectives.

The study identified that the post test hemoglobin Mean score in the experimental group is 12 and SD is 0.89. In control group Mean score is 10.3 and SD is 0.77. The Mean difference is 1.7. The calculated' value 6.12 is higher than the table value 2.0.

The calculated value of't' test suggested that was significant difference before and after the consumption of Miracle leaves extract among adolescent girls. Post test score in the experimental group shows there is an improvement in the level of Hemoglobin.

Chi-square test was used to find out the association between the demographic variable and dependent variable. It was found that there is an association between the demographic variables and independent variables.

Conclusion

The conclusion drawn from the findings of the study are as follows:

1. Miracle leaves extract was found to be an effective nursing intervention in increasing hemoglobin level.
2. Miracle leaves extract was found to have no side effects when compared with other pharmacological treatment.

3. Samples satisfaction is very much higher in this intervention.
4. The findings of the study enlighten the fact that Miracle leaves extract can be used as a cost effective nursing intervention in improving the hemoglobin level.

Nursing implication

The findings of the study reveal the implication on nursing practice, nursing education, nursing research and nursing administration.

Nursing Administration:

1. The result of the study encourages the nurse administrator to conduct in-service education programs on various types of non-pharmacological treatment to increasing the hemoglobin level.
2. Nurse administrators can create awareness among nurses that Miracle leaves extract is a very good cost-effective nursing intervention to increasing hemoglobin level in blood.

Nursing Education

1. This study can motivate student nurse to explore new strategies for effective improvement of hemoglobin level in blood.
2. This research report can be kept in library for reference of nursing personnel and other health care professionals.
3. The nurse educator can take independent decision based on principles of health care.
4. Nurse educator can train and encourage the student nurse to implement Miracle leaves extract as a non-pharmacological management.

Nursing Practice

1. Miracle leaves extract is a safe and better modality which brings a higher level of satisfaction for adolescent girls.
2. This intervention could bring benefits to both adolescent girls who are on pharmacological therapy and not on the same.
3. It also brings a long term effect and higher level of improvement of hemoglobin level, thus the samples feels better and can avoid complication.

Nursing Research

The nursing implication of the study lies in the scope for expanding the quality of nursing service. In this area of evidence based practice, publication of these studies will take nursing to a new horizon.

1. The Nurse Researcher can conduct other research studies based on the research evidence from this study.
2. A comparative study can be done to determine the effect of Miracle leaves extract with other non-pharmacological measures.
3. Similar study can be conducted on large sample do it could be generalized.

Limitation

1. The sample size of the client was only 60. Hence generalization is not possible.
2. The data collection was only one month.
3. The study was limited only to the Adolescent girls with anemia at Arunachalam Higher Secondary School.
4. Extraneous variables are controlled to some extent only.

Recommendation

1. The study may be replicated with randomization in selection of a large sample.
2. Nurse researcher can do studies related to Miracle leaves to improve hemoglobin level.
3. Studies can be to determine the other therapeutic benefits of Miracle leaves extract.
4. Nurse researcher can do studies related to the effect of Miracle leaves extract to improve the hemoglobin and to improve the quality of care.

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APPENDIX : A

ETHICAL COMMITTEE CLEARANCE

APPENDIX : B

LETTER SEEKING EXPORT OPINION FOR TOOL VALIDITY

APPENDIX : C

PERMISSION LETTER FOR CONDUCTING THE STUDY

APPENDIX : D

CERTIFICATE FOR TOOL RELIABILITY

APPENDIX : E

LIST OF EXPERTS FOR TOOL VALIDATION

1. **Dr. Elizabeth.K.E, M.D, DCH, PhD.,**

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   Karakonam

8. **Mrs. Malkhijah M.Sc (N).,**
   Reader,
   Christian College Of Nursing,
   Neyyoor

APPENDIX - F

CONTENT VALIDATION CERTIFICATE

APPENDIX : G

SECTION A

DEMOGRAPHIC DATA

1. Age
   a. 13 years
   b. 14 years
   c. 15 years
2. Education
   a. 8^{th} standard
   b. 9^{th} standard
   c. 10^{th} standard
3. Religion
   a. Hindu
   b. Christian
   c .Muslim
4. Food habits
   a. Vegetarian
   b. Non – vegetarian
5. Age at Menarche
   a. 10 - 11 Years
   b. 12- 13 Years
   c. 14-15Years
6. Duration of Menstrual cycle
   a. 2-4days
   b. 5-7 days

7. Education of Father

a. Primary School Education

b. Secondary School Education

c. Higher School Education

8. Education of Mother

a. Primary School Education

b. Secondary School Education

c. Higher School Educational

10. Occupation of Father

a. Coolie

b. Private Employee

c. Government Employee

11. Occupation of Mother

a. Coolie

b. Private Employee

c. Government Employee

12. Type of Family

a. Nuclear Family

b. Joint Family

c. Single Parented Family

d. Extended Family

13. Monthly Income of Parents

a. Rs.<5000/-

b. Rs. 5001- 10, 000/-

c. Rs.>10, 001/-

14. Source of Health Information

    a. Parents

    b. Friends

    c. Medias

    d. Teacher

    e. Relatives

SECTION B

APPENDIX : H

SECTION A

DEMOGRAPHIC VARIABLES

Item no	Relevant	Need modification	Not relevant	Remarks
1				
2				
3				
4				
5				
6				
7				
8				
9				
10				
11				
12				
13				

SECTION B

ANEMIA ASSESSMENT CHECK LIST

Item No	Relevant	Needs Modification	Not Relevant	Remarks
1				
2				
3				
4				
5				
6				
7				
8				
9				
10				
11				
12				
13				
14				
15				

APPENDIX : I

DIGITAL HEMOGLOBINOMETER

DESCRIPTION

A Hemoglobinometer is an instrument used to determine the Hemoglobin content of the blood by spectrophotometric measurement. Portable Hemoglobinometers provide easy and convenient measurement, which is particularly useful in areas where clinical laboratories are available. It is also useful in emergencies due to its ease-of-use, accuracy and fast delivery of results.

The Level of Anemia is classified as,

Above 12gm/dl - Healthy

10-11.9gm/dl - Mild anemia

8-9.9gm/dl - Moderate anemia

Below 8gm/dl - Severe anemia